ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

RAW-HILL CO.
CALIFORNIA

SEPTEMBER, 1941

25c a Copy

It's much easier to cook the modern way in your Electric Roaster
A fine big dinner ... roast, potatoes, a vegetable or two and dessert ... all done without a thought from you for hours and hours. Prepare the food. Pop it in your Electric Roaster. Set the control and forget about it until you are ready to serve. Think of the freedom that means for you!
as low as $3 DOWN
FREE TRIAL in your Home
AT YOUR DEALER OR EDISON OFFICE

Come on! We're on a picnic deluxe with our Electric Roaster
FREE TRIAL in your Home
as low as $3 DOWN
AT YOUR DEALER OR EDISON OFFICE

Too hot to cook? not with a modern
Westinghouse
ELECTRIC ROASTER!
FREE TRIAL in your home
As low as $3 DOWN
YOUR DEALER OR EDISON OFFICE

Edison advertising carries roaster sales to new HIGHS

★ These Edison advertisements—in the newspapers and by direct mail—continue the story of modern, easier, better cooking with an electric roaster. They direct the prospect to her nearest dealer to see these advantages for herself. To cash in on the full value of this huge sales promotion campaign, display, demonstrate and advertise the electric roaster yourself. Tie in for more profit.

SOUTHERN CALIFORNIA Edison

8-41

ELECTRICAL WEST (with which is consolidated The Journal of Electricity, September, 1941. Vol. 87, No. 3. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
Copyright, 1941. McGraw-Hill Company of California.

THEY'RE BOTH 15 KVA But I'd Rather Handle the SPIRAKORE!

LIGHTER WEIGHT AND SMALLER SIZE are advantages of the Spirakore transformer that were made possible by the ingenious Spirakore design and the use of cold-rolled, high-permeability, silicon core steel. For example, in the 15-kva 2400-volt rating, the Spirakore transformer weighs only 390 pounds. Compared with the 505 pounds of the superseded design, this is a weight reduction of 23 per cent.

Other improvements resulting from the Spirakore development include a simpler, stronger interior construction, lower exciting currents, and improved impulse and thermal characteristics. Together, they make Spirakore your best buy in distribution transformers. General Electric Company, Schenectady, N. Y.

Specify Spirakore transformers—designated Type HS. Available in many ratings up to 500 kva

GENERAL ELECTRIC

402-29-5100

Here in the WEST

People

Fred Garrison

is General Electric's Pacific district meter specialist. A Nebraskan, he was an electrical engineering graduate, class of 1917, from that state's university. He immediately enrolled in the G-E test course after which he spent a year and a half in the company calculating room. Later he was in the a-c engineering design section working on synchronous machines. He left G-E in 1923 to join Southern California Edison's test department, but 5 months later was back in G-E's engineering department in Los Angeles. Subsequently he joined the central station sales staff and in 1939 took over his present responsibilities.

Lights Up

A host of authors contributed the lighting material that makes up this special section. They are the illuminating engineers whose splendid work has made the West a leader in all phases of lighting technique. This section shows a wide range of lighting applications and many new ideas that can be applied generally. Every phase of the art is covered, from sports illumination to defense and decorative installations. And to top it off there are pages that tell what the immediate plans of the major utilities are.

Power Shortage

There are those who contend that the Far West faces a defense power shortage. Federal agencies have proposed huge government owned projects scheduled into 1947 to meet these alleged deficiencies. What are the facts? This discussion considers the defense load that has developed to date and the possible load that may accrue and concludes that the federal program is a power *blitz* aimed at the utility industry.

Pages

What About a Defense Power Shortage? 27

Priorities Plan Insures Production 30

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Pictorial review of Western industrial, commercial and industrial lighting for 1941.

"The Party Is Over" 46

Western market buyers told what to epect in days of national crisis.

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By FRED GARRISON——Metering technique improvements assure greater accuracy, frequency and p.f.

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Cover: A completely electrified poultry farm on lines of Puget Sound Power & Light Co.

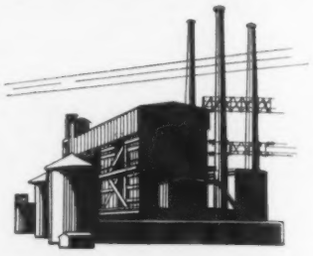
Preview

IES Lamps

Keyed to the fall and winter selling season, next month's Sales Guide will cover IES lamps. Despite past sales efforts, the market for these has barely been scratched. If every home had the requisite number of these eye-savers, the sales would run into millions of units.

Steam Stations

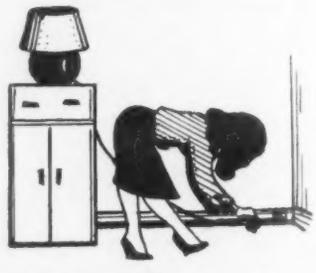
A building on the shores of San Francisco Bay are three steam-electric generating plants that mark the ultimate in industry-utility cooperation. Pacific Gas and Electric Co. and the three



cooperating oil companies have worked out a plan for maximum use of refinery wastes. The plants incorporate many unique and interesting design and operating characteristics. These will be brought out in a novel pictorial treatment that is certain to command interest.

Adequate Wiring

Until all homes, stores, factories and commercial buildings are wired so that they obtain the maximum usefulness from electrical equipment and appliances, there will always be an adequate wiring problem. There has been a lotof progress in the West during the last year in



winning public acceptance of the adequate wiring idea. The next issue will tell of methods that have proved successful and will present ideas that are new.

Grand Coulee

In the making is a pictorial insert on this huge power development that will parallel the editorial treatment accorded Bonneville and Boulder Dam in past issues of *Electrical West.*

How to get Narrow Band Widths with only 1/3 THE EXCITING CURRENT!

Allis-Chalmers 5/8% Step DFR Regulators Maintain Narrower Band Widths . . . Require 67% Less Wattless Current! Here is One Way You Can Save the Cost of Static Capacitors . . . Release System Capacity for Pay Loads!

You don't have to burden your system with extra wattless current to get narrow band widths.

For the Allis-Chalmers 5/8% Step Regulator holds narrow band widths — as low as ±3/4 volts for some feeders — and does it with *only 1/3 the excitation current required by older types of regulators!*

Let's take a typical case. A public utility needs ten 72 kva, 2400 volt regulators. Their chief engineer finds that he can free his lines of 122 reactive kva if he installs Allis-Chalmers DFRs rather than older type regulators.

That's a total saving of $850 on static capacitors alone* — actually 4% of the regulators' cost! But even if static capacitors aren't used, 55 kva of system capacity will still be released (with 90% power factor loads).

Figure out what savings like this can mean on your lines! And don't forget DFR's narrower band widths . . . reduced losses . . . quieter operation . . . minimum maintenance costs!

Bulletin B-6065 gives complete information on Allis-Chalmers 5/8% Step DFR Regulators. Write for your copy . . . *today!*

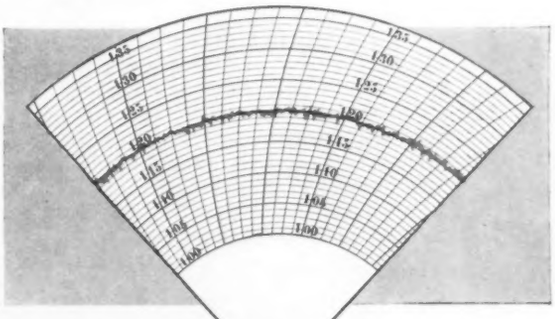
*Average installed cost—$7 per kva.

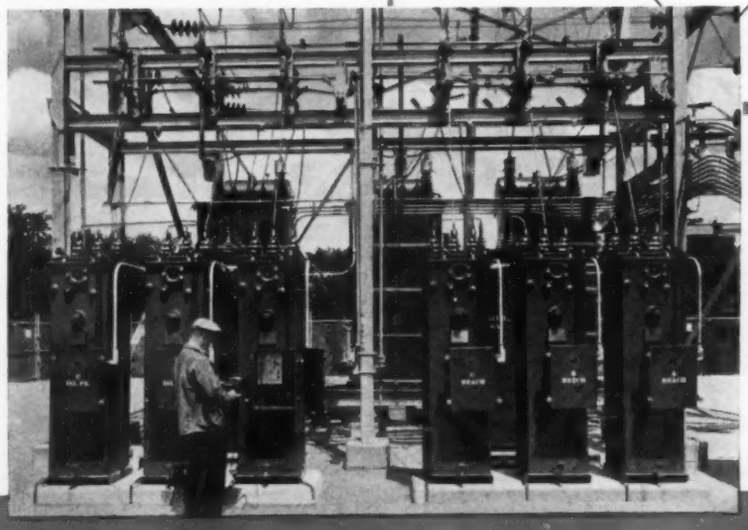
A 1402

5/8% Step Regulators Have Been Holding 2 VOLT BANDS FOR 7 YEARS!

When the Allis-Chalmers 5/8% Step Regulator was designed over eight years ago, the size of steps was selected as 5/8 of 1% because data gathered from utilities all over the country indicated that the 2 volt band was desirable.

Look at the accompanying chart, a typical record obtained under actual service of an Allis-Chalmers DFR. It shows how the voltage is easily held within a 2 volt band.





Northwestern system likes the lower excitation current and closer band widths provided by these six 72 kva, 2400 volt Allis-Chalmers 5/8% Step DFR Regulators.

These 5/8% Step Regulators Are Famous for Better Regulation at Lower Cost! Choose the Regulator to Fit Your Purpose!

DFR — 12 to 250 kva, single phase
AFR — 20.8 to 750 kva, three phase
CFR (air cooled) — 36-96 kva, 2400 volt, single phase

ALLIS-CHALMERS
MILWAUKEE · WISCONSIN

GOING PLACES

QUICKLY

AND

EFFICIENTLY

Gorilla Grips are solving the problems of many industrial plants today.

Stock inventory sets including all popular types of connectors. Nuts fit each type and take 19 wire sizes. At fingertips — low investment — convenient.

National Electric
PRODUCTS CORPORATION
1300 Fulton Bldg. Pittsburgh, Pa.

PRODUCTS
that are news

Self-Reflecting Sunlamp (900)

A self-reflecting sunlamp, which fits into ordinary house sockets, has been developed by General Electric Co. and named RS Sunlamp. The lamp consumes 275 watts, is designed to

operate on 110-125 volts 50-60 cycle circuits. Ballast control, reflector and elements for producing ultra-violet and infra-red are built into a single self-contained, all-glass, hermetically sealed unit.

Washer Line (901)

Universal's 1941 line of "wash white washers" includes 4 complete new models. Selling features include: time-a-matic switch that automatically shuts off the current when washing is finished. Times any period from one to 15 min.; marked for proper washing time for different fabrics; an overload Protect-O-Switch; a select-a-matic wringer pressure indicator; Universal-Lovell power electric, 6-position wringer, and other quality attributes.

EMT Available (902)

Triangle Conduit & Cable Co., Inc., have announced they are now in a position to supply EMT (thin wall conduit) with baked-on black enameled finish, approved by the Underwriters. According to the company, this development is brought about because of the shortage of zinc.

Welding Positioner (903)

A 3,000-lb. capacity welding positioner has made available by the Ransome Concrete Machinery Co. The new positioner has a 40-in. square machined steel table-top provided with 4 radial and 4 longitudinal T-slots to take ¾-in. bolts providing easy set-up. A 3,000-lb. load with a center of gravity 12 in. above table and 12 in. eccentric from center of table may be carried. A tilting motor tilts the table from horizontal to 45 deg. beyond vertical, and the table top may be rotated at constant speed or variable speed as desired.

Compact Circuit Breaker (904)

Designed especially for use in industrial, central station, or power plants where operation under repetitive duty cycles is required, a new and compact circuit breaker is announced by Westinghouse Electric and Mfg. Co. The type DK breaker is available in 15,000 and 25,000 amp. interrupting capacities in all standard current ratings from 15 to 600 amp. for operation on one, two, three or four pole 600 volts a.c. or 250 volts d.c. circuits. The breakers are equipped with a rotary type, removable operating handle for controlling the breaker manually. In addition, electric operation can be provided by a motor mechanism and a shunt trip. The motor-operating mechanism is a single enclosed unit in itself. The breakers are available in four different forms: open-type and three forms for enclosed applications. The standard enclosed breaker consists of an open-type unit mounted on a sheet-metal housing. Available accessories for these breakers include oil-suction magnetic or thermal-magnetic overload trip unit which are adjustable for minimum tripping.

Contact Switch (905)

Delta-Star Electric Co. has developed a dual high-pressure contact switch with two outside insulators stationary, and a third mounted on ball bearings and free to be rotated either by hand or motor. The blade mechanism is mounted on a 45 deg. enclosed bearing which imparts a rotating insulator motion with a switch blade, simultaneously lifting and turning it. Opposite rotation of the insulator unit lowers and turns the blade into high-pressure contact with spring locks contact shoes mounted on the right hand side outside insulator units. By means of a "high spot" cam on the 45 deg. angle bearing, a high-pressure contact is also made at the hinged end of the blade. The effect is comparable to that of a toggle mechanism at toggle position. According to the manufacturer, this dual-high-pressure contact switch is made for all voltages and capacities up to 4000 amp., the single-pole unit illustrated being 34.5 kv., 600 amp., 3-pole service.

999 Power Unit (906)

National Transformer Corp. has produced their "999 Power Unit", which according to the company provides instantaneous light in fluorescent fixtures when switched on, even at lower temperatures and low line voltages, overcoming the usual waiting period for illumination. In addition it is claimed this unit eliminates the need for starters, starter switches, starter sockets and compensators, thus stabilizing lamp life and removing one fluorescent lighting problem. Operating on a patented, self-polarized, double circuit principle, the National Power Unit provides full brilliance, reduces stroboscopic effect (cyclic flicker) to a minimum, operates with exceptional quietness, has no radio interference and the power factor is corrected above 90 per cent. According to the company, the unit is easily installed, guaranteed for a year and so constructed that under no conditions can it overheat or be seriously damaged by overloading when connected to a circuit of a specified voltage and frequency.

HAND THESE *Electrical Preparedness* PROBLEMS TO YOUR GRAYBAR MAN

WHEN your hands are full trying to keep up production, why not turn to your GRAYBAR Representative for assistance in the task of keeping your plant "electrically fit." Particularly when the maintenance problem is being complicated by multiple-shift operation, you'll make important time-saving gains by a foresighted policy on electrical purchases . . . put in practice "via GRAYBAR."

Here are some of the ways your GRAYBAR Man can help you:

1. He'll save you the time required for individual product investigation by making competent and unprejudiced recommendations of "best buys" that fit your plant conditions and minimize shut-down time.

2. When the customary maintenance items you purchase are not available, he'll suggest alternative ways and types of equipment for accomplishing the same result.

3. He'll help to keep you advised of the types of electrical supplies where a foresighted purchasing policy is desirable to protect your future operations.

4. When supplies are needed for work essential to national defense, your GRAYBAR Representative can advise on procedures for meeting priority regulations, on items for which a priority rating is required.

5. When you keep your GRAYBAR Man informed of your anticipated needs, even where it is necessary to delay release of actual orders, he can frequently take action to your benefit by a foresighted adjustment of local GRAYBAR stocks.

6. An open order placed with your GRAYBAR Representative is governed by the same fair pricing policy as a request for estimates. Such a procedure saves you time and may speed delivery.

7. GRAYBAR specialists in the fields of industrial lighting, inter-communication and other electrical problems are "on call" through your local GRAYBAR office to help you make plans or draw up specifications.

Remember, too, that every GRAYBAR Man regards your *future* good will as importantly as your present orders. To the full extent made possible by unexcelled nationwide resources in the field of electrical distribution, they are individually striving to save your time and speed your production.

GRAYBAR

Executive Offices: Graybar Building, New York, N. Y.

OFFICES IN OVER 80 PRINCIPAL CITIES

GRAYBAR QUALITY *Everything Electrical* GRAYBAR ELECTRIC COMPANY

REASONS WHY ENGINEERS CHOOSE THE NEW ALLIS-CHALMERS DISTRIBUTION TRANSFORMER

1 Simplified Supports for Direct Pole Mounting Cut Installation Time. Standard Support Spacing and Bushing Location Mean Complete Interchangeability of All Sizes and Makes.

"It's Got Easier Installation Greater Dependability Money-Saving Operation!"

Yes, that's what utility engineers are saying about the new Allis-Chalmers Distribution Transformer—the transformer you helped us design.

And, because we had access to the combined years of operating experience of systems all over the country, you get a transformer that's got everything you always wanted.

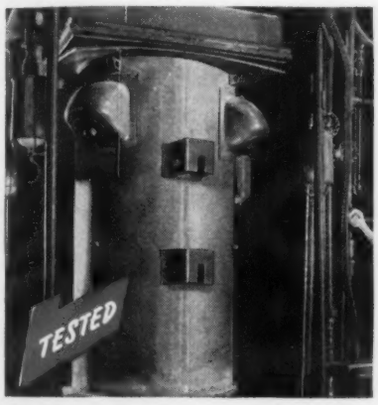
With standardized locations of supports and bushings, all sizes and makes are completely interchangeable. That means your specifying and buying are made simpler . . . deliveries are faster . . . installation is easier! It also means that you don't have to carry as large a stock of complete units or parts.

Remember, too, when you buy the new Allis-Chalmers Distribution Transformer with its six big engineering features, you get built-in quality that's second to none—the result of advanced engineering combined with skilled workmanship and the best materials money can buy!

Bulletin B-6159 gives complete engineering information on the new Allis-Chalmers EEI-NEMA Distribution Transformer. Write for your copy . . . *today!* Allis-Chalmers, Milwaukee, Wis.

A-1413

ALLIS-CHALMERS DISTRIBUTION

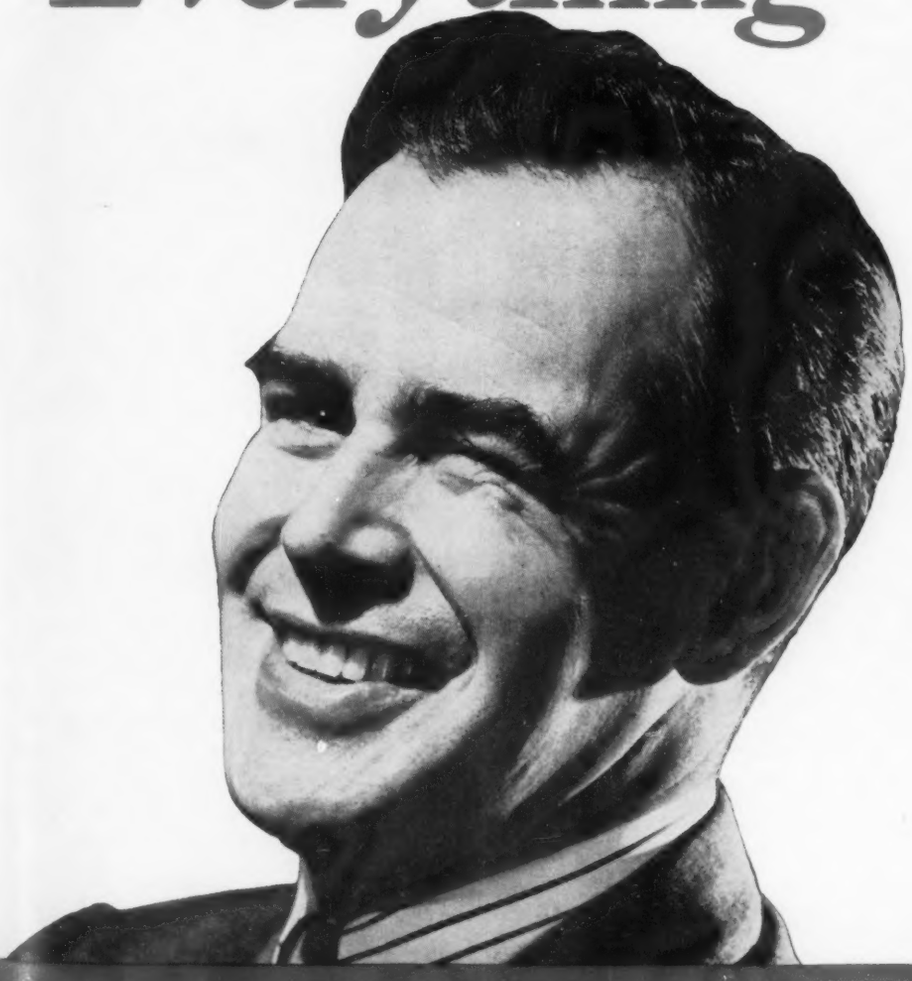


2 New, Durable, Copper-Bearing Steel Tanks. Tested Under Pressures Far Greater than Normal . . . Prevent Oil Leakage, Assure Long Life and Complete Safety.

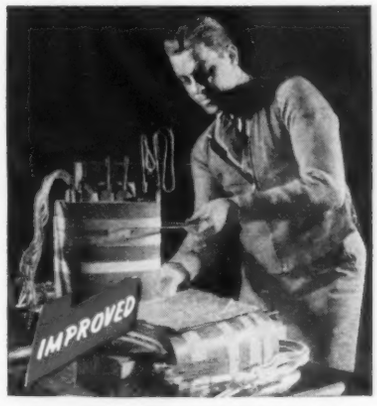
3 New Spra-bonderizing Process . . . Plus Triple Coat Automobile Finish Give Tanks Positive Four-way Protection Against Attacks of Rust and Corrosion.

4 Extra-heavy Porcelain Coordinated Bushings with Liberal Creepage Offer Maximum Reliability Under Fog, Dust, Chemical or Other Adverse Conditions.

Everything---

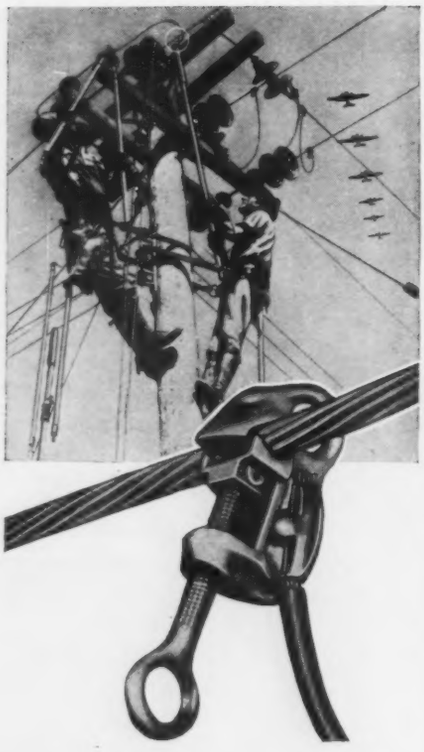


5 Double Conductor Insulation . . . Flexible Enameled Wire . . . Plus the Added Protection of Well-Lapped Cable Paper Provide Double Safety Against Winding Failures.



6 Improved Core and Coils, Liberally Designed with No Manufacturing Short Cuts . . . Mean Extra Years of Service-free Performance Under All Types of Operating Demands.

TRANSFORMERS *Cut Operating Costs*



Tap New Service Extensions with . . .

TIPS PERMA-GRIP TAP CLAMPS

Preparedness is a good idea in line construction, too. The use of Tips Perma-Grip Tap Clamps on service extensions prepares the line for quicker, easier maintenance without service interruptions. Build the extensions and tap them in hot with the Grip-All Clamp Stick and Tips Perma-Grip Tap Clamps—made in a variety of sizes for every job. Perma-Grips give you three point positive contacts, proper electrical conductivity, high mechanical strength, and quick easy application.

A·B·CHANCE CO. CENTRALIA MISSOURI

Connector (907)

Burndy Engineering Co. has developed a connector to join copper cable conductors on end, or parallel to each other, or at an angle. It may also be used as a coupler or reducer. According to the manufacturer the swivel principle of the "Versi-Link" permits cables to be inserted into either tee from seven different angles and rigidly clamps the cable in that position. Each cable clamping element will accommodate a large range of conductors. Minimum and maximum sizes are each gripped in the conductor connectors without any extending parts or exposed threads.

F Units (907-A)

Hygrade Sylvania Corp. has a new line of continuous row Miralume fluorescent units. These units, designated F-104, F-208, F-154 and F-308, may be joined end to end with like units or with one another to form a continuous wireway enclosure. They are also supplied with EMB for individual mounting and when a connecting band for continuous row assembly. According to a manufacturer, with this arrangement instead of providing a single electrical outlet for each unit, one outlet can be made to supply a row of units. Starts are located in the top.

High and Low (908)

New high-and-low-tension outlets totally encased in Tenite for Fiberduct underfloor raceway systems were introduced by General Electric's appliance and merchandise department. These new outlets are to replace some of the former brass outlets used with Fiberduct. The non-metallic surface of these plastic outlets makes them a good accessory with Fiberduct, according to the company, especially when a fully insulated system is required. They withstand breakdown tests of 4500 volts.

Photoelectric Inspection (909)

Photoswitch, Inc., has developed a photoelectric inspection and registration control offering simplified controlling or inspecting, cutting and printing operations on cellophane, paper, cloth, tin, etc. All amplifying tubes are standard vacuum type and the unit combines extreme sensitivity with high-speed operation, according to the manufacturer. It observes registration marks from penetration of light through transparent and translucent material as well as reflection from opaque material. An impulse of a short duration as .001 second will be detected by the control and converted into a controlling operation. Upon receiving an impulse, the control relay operates and remains in operation until the controller circuit has completed its function.

Indoor Transformer (910)

Designed for disconnecting or interrupting of circuits in wet or dusty locations, a non-automatic enclosed De-ion circuit interrupter is a new Westinghouse Electric & Manufacturing Co. product. Enclosures (NEMA Types 4 and 5) are furnished in either cast aluminum or cast iron, both of which have an aluminized finish. Closely machined fit between handle shaft and bushing with heavy rubber gaskets between enclosure make them water tight. Current ratings range from 50 to 600 amp., 2 or 3 poles, at 250 to 600 volts a.c. and 125/250 to 250 volts d.c. A high interrupting capacity is provided to interrupt a circuit adjusted for 5000 to 10,000 amp. dependent on frame size. De-ion arc quenchers confine, divide and extinguish arcs almost instantly as the contacts open, thus prolonging contact life, according to the company.

ON HIS WAY TO *Safety*

IT takes tough muscles to do a lineman's job—it takes skill, too, and steady nerves. But the man on the pole knows his Klein equipment will guard his safety. He throws his weight on his climbers with confidence—he knows his belt, his safety-strap, too, are the finest that he can buy when they carry the Klein trade-mark.

Your copy of the Klein Pocket Tool Guide will be sent on request.

ASK YOUR SUPPLIER

Foreign Distributor:

International Standard Electric Corp., New York

Mathias **KLEIN** & Sons

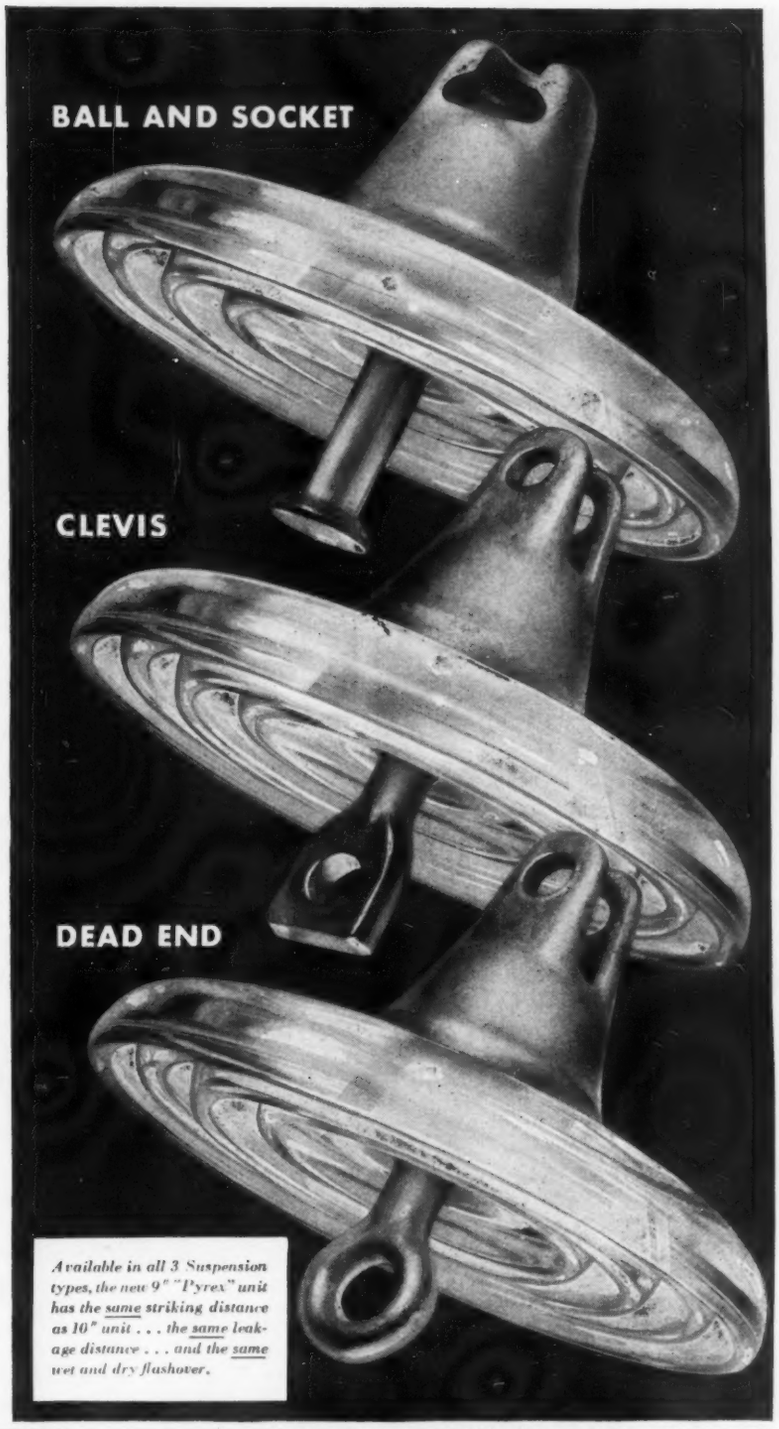
Established 1857 Chicago, Ill. U.S.A.

3200 Belmont Avenue, Chicago, Illinois

ONLY PYREX BRAND INSULATION can offer this 9″ unit!

Save 13% on first cost then save on handling and labor!

CORNING'S new 9″ "Pyrex" brand insulator gives you everything and *more* than 10″ insulators, of corresponding rating, made of other materials! Right off the bat you start with a clear 13% saving in initial cost. In addition, the new "Pyrex" 9″ insulator is lighter, easier-to-handle . . . saves you plenty on installing, trucking and labor! Weighs only 7½ pounds packed, compared with the usual 12 pounds. Has exactly the same leakage distance and wet and dry flashover characteristics as 10″ units. Incorporates unusually high mechanical strength through glass tempering, improved cementing and assembly technique. Write for detailed specifications and test data today. Corning Glass Works, Insulation Division, Corning, New York.



Available in all 3 Suspension types, the new 9″ "Pyrex" unit has the same striking distance as 10″ unit . . . the same leakage distance . . . and the same wet and dry flashover.

GENERAL SPECIFICATIONS FOR 9″ UNIT

Mechanical and electrical rating, pounds	15,000
Dry flashover, volts	81,000
Wet flashover, volts	49,000
Leakage distance, inches	11¼
Impact resistance, inch-pounds	75
Net weight, pounds	6½
Packed weight, each pound	7½
Standard package	6

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works, Corning, N. Y.

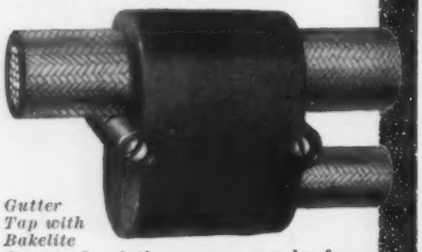
CORNING *means* Research in Glass

Pyrex Insulators BRAND

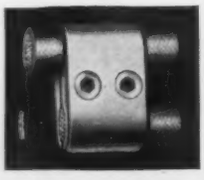
The MOST COMPLETE
LINE OF
Cable Taps

Parallel and 90° taps—and combinations—for the widest variety of applications. For conductor sizes up to 1,000,000 CM.

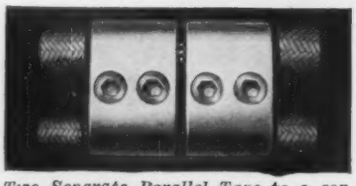
Now you can select from a really *complete* line of standard and special taps. Carefully designed—made right—and giving excellent service to all classes of users.



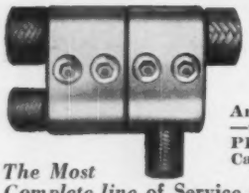
Gutter Tap with Bakelite Cover. Insulating covers can be furnished for all types of Penn-Union Cable Taps.



2-Way Gutter Tap; main and branch sizes 8 to 1,000,000.



Two Separate Parallel Taps to a continuous main conductor.



Combination Cable Tap; one branch tap parallel to main, and one at 90°.

And many more—write for the PENN - UNION Catalog.

The Most Complete line of Service Connectors—Terminals—and thousands of other fittings, for all requirements.

KENNETH ANDERSON CO.
2115 So. San Pedro St., Los Angeles
NORTHWESTERN AGENCIES
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F. M. NICHOLAS CO.
1123 Harrison St., San Francisco
Penn-Union Electric Corp., Erie, Pa.

PENN-UNION
Conductor Fittings

Sun Lamp Features (911)

A sun lamp with self-contained reflectors has been announced by Westinghouse Electric & Mfg. Co. The lamp, known as Westinghouse Mazda RS sunlamp, operates directly from an ordinary lighting circuit without an auxiliary transformer or ballast. The auxiliary is replaced by a filament resistance mounted inside the glass bulb, starting electrode in the inner quartz tube. The starting electrode is in series with the filament resistance. Thermal switch mounted next to the resistance filament allows the starting electrode in the quartz tube to heat. As soon as the filament and starting electrode are heated, the thermal switch opens and the mercury arc starts. The lamp consumes 275 watts, operates a.c. circuits at voltages from 110 to 125.

Fuse Equipment (912)

Expanding their range of fuse equipment, Schweitzer & Conrad, Inc., have available the type SMG Power Fuse for high voltage service. According to the company, these fuses provide increased interrupting capacities in the voltage range from 66 to 132 kv. They are designed for application on the high-voltage sides of stepdown substations, at sectionalizing points on transmission lines, and at other points where short circuit energies may be high and fast. Short-circuit interrupting ratings range from 9000 amp. rms. for the 46 kv. fuse to 5000 amp. for the 132-kv. fuse. A field-replaceable fusible element assembly is housed in a Pyrex glass tube corrugated at the upper end, and a condenser at the vent for confining the gas discharge. Important is the means provided for producing a long gap between the terminals of the fusible section at optimum speed for efficient arc interruption. An internal sleeve is driven downward when the fuse blows, projecting below the holder to indicate the blown condition clearly.

Steam Iron (913)

An automatic iron with controlled steam has been produced by the heating device section of General Electric Co., and christened the "Aluron". According to the manufacturer, correct soleplate temperatures for different fabrics are thermostatically controlled by a control knob on the handle of the iron, permitting the ironing of all kinds of fabrics either with steam or without. A dial on the top of the iron is marked with the names of the fabrics and correct temperature for each. Main advantage claimed for the new iron is that water is not under pressure and the reservoir does not need to be emptied for straight ironing. Steam is generated only as it is used, when the control is set for steam ironing, drops of water are allowed to fall on the soleplate, vaporizing to form steam. The iron operates on a.c. only, 1000 watts, 115 volts.

Rubber Plugs (914)

An unbreakable all-rubber multiple-outlet plug (cube tap)—the first made—has been placed on the market by U. S. Rubber Co. The plug has been approved by Underwriters' Laboratories and is claimed to have unusual safety qualities. According to the tests, it is capable of withstanding extremely heavy pressure, and its patented construction makes it impossible for any metal parts to become exposed under any conditions. The plug is smaller than older types and is scratchless and sound-proof.

Pressure Switch (915)

Jefferson Electric Co. has a new pressure switch No. 611-030 for use on domestic water pump, pneumatic and oil systems, to control the stopping and starting of small single or polyphase a.c. motors on predetermined pressure setting. These switches have a working pressure range of up to 80 lb. inclusive and a differential between the "on" and "off" positions may be specified and adjusted according to customer's specification.

Time Switches (916)

Paragon Electric Co. announces a new 300 series of time switches. A precision instrument selling at a reasonable price, it has only two exposed gears, all others operate in a sealed oil bath. Operation is by slow speed (450 rpm) industrial type self-starting synchronous motor. For actuating off-tripper—the most difficult operation performed—there is a reserve power of 40 lb. or an equivalent of 2,000%.

Tear-Off Device (917)

Leeds & Northrup Co. now have a daily tear-off device for Micromax strip-chart recorders which enables users of strip-chart recorders to tear off and file a record of each day's operation. Daily strip-chart records are thus provided in a form convenient to file.

Ventilator (918)

A new kitchen wall box ventilator, adjustable for wall thicknesses, 5¼-in. to 13 in., has been developed by Wagner Electric Corp. Inside grille of the ventilator is finished in white enamel. Door on outside opens by spring tension when ball-chain is released, and fan starts and stops automatically with opening and closing. Another new design by the company is a window ventilator with an adjustable panel in sizes from 23 in. to 36 in. It is a single-speed, 10-in., delivers 560 cu. ft. min.

Cycle Control (919)

A multiple-cam time cycle controller, designated by the company as Model A-118 Impulse-Sequence Cycle Controller, for timing mechanical operations in industrial processes, has been put forward by The Bristol Co. Where a number of factors must be accurately timed, the impulse-sequence cycle controller actuates or engages, at the correct time in each cycle, the necessary electrical devices for carrying out the schedule.

Substations (920)

Metal-enclosed, factory-built substations, compactly designed for power and lighting service in industrial plants, power-station auxiliaries, etc., have been announced by the General Electric Co. These substations consist of one or more metal-clad switch-gear units in the incoming-line section, a 3-phase transformer section filled with oil and one to 15 metal-enclosed air circuit breakers on the low-voltage-feeder side. According to the company, they can be installed indoors or outdoors to transform power from the 2300- to 15,000-volt range to 600 volts or below and provide protection and control for the low-voltage feeders.

Check these advantages

	NEW LOSS RATIO	LOW EXCITING CURRENT	GOOD REGULATION AT 100% P.F.	GOOD REGULATION AT 80% P.F.	IMPROVED SURGE STRENGTH	LARGE COIL AREA FOR COOLING	WOUND TYPE CORE	ROUND COILS
L-M ROUND-WOUND TRANSFORMER	YES	YES	YES	YES	YES	YES	YES	YES
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Write in the name of the transformer YOU think best. Fill in "yes" or "no" in each column. We want YOUR opinion.

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Here is an opportunity for you to pass your judgment on new developments in distribution transformers.

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We know it because WE can put "yes" after the name "L-M ROUND-WOUND Transformer" in every column of the chart above.

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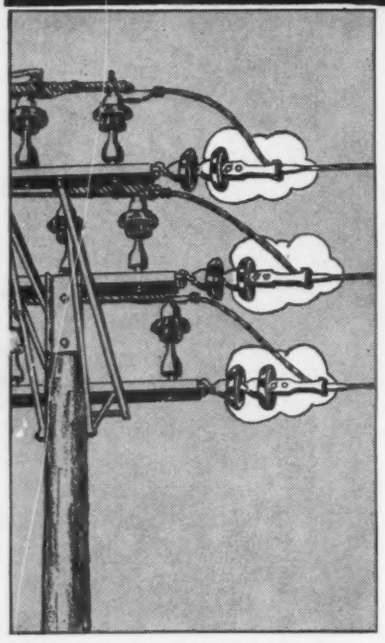

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• **RELIABLE STRAIGHT-THRU DEAD ENDS with rigid clevis make convenient, low cost and high strength connections to disc insulators. The end of the wire can be fed STRAIGHT-THRU the unit and used as a jumper. Hole in clevis enables the lineman to insert bolt for attaching rope blocks when pulling slack. The dead end has the same design features as the Reliable Straight-line Splice.**

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Solenoid Starters (921)

Arrow-Hart & Hegeman Electric Co. has a complete new line of magnetic Solenoid starters and contactors, sizes "0" and "1". Separate Bakelite units for each pole confine the arc and exclude dust, according to the manufacturers. All connections are made from the front, and coils with clearly visible ratings are easily changed. Separate electrical interlock switch, enclosed in Bakelite, is supplied normally open or closed. Reset button is independent of the cover. Positive quick make and break switching mechanism in overload relay is insulated from the bimetal and heater. Overload relays are regularly supplied for manual reset, but can be changed for automatic reset if desired. These starters are for control of motors up to 7½ hp. single or polyphase 110-550 v.a.c.

Pendant Luminaire (922)

Curtis Lighting, Inc., has originated a fluorescent pendant luminaire noteworthy for attractive appearance. Diffusing glass is used in a smooth side panel, and a white Fluracite louver provides a generous outlet for direct, high-level lighting. The unit, known as "Starlux," provides for coupling units together and installing in continuous lines. Starlux uses four 40-watt fluorescent lamps. The extreme shallowness (depth 6⅛ in.) distinguishes the unit among fluorescent four-lamp luminaires.

Eskimo Pantry (923)

Stewart-Warner Corp. has a home freezing locker plant known as the Eskimo Pantry. Features include right-angle chilling surfaces, 4 and 5-in. insulation. It has 5.14 cu. ft. net capacity, and the manufacturers claim that sub-zero temperatures can be maintained.

Electric Roasters (924)

National Enameling and Stamping Co. electrical division, have a new series of electric roasters featuring time clocks, thermostats, and signal light control, spring actuated oven covers and a special dial browning vent marked for all types of cooking.

Portable Transformer (925)

For use with portable instruments and recorders, a new portable potential transformer has been developed by Westinghouse Electric & Mfg. Co. Enclosed in an aluminum case designed to withstand wear, consideration is given to the fact that it must be light in weight to be portable. All terminals are of polished nickel and terminal markings and polarities are clearly marked. These PV-130 transformers are available for input voltages between 230 and 2300 volt with 115 volt output on 60 cycle lines. According to the company, accuracy and construction is such that they may be used on all portable and laboratory applications in delta connection, except for standards.

Pneumatic Operation (926)

Pneumatic operating mechanisms are now available for General Electric outdoor oil-blast circuit breakers. Three types, MA-11, MA-12 and MA-13 provide a complete line of mechanisms for these breakers up to 230 kv. These require a low operating current and are designed for fast operation without abnormal stresses on the breaker—even super-speed (20 cycles) reclosing of the largest breakers. The standard compressor unit is driven by an a.c.-d.c. small motor.

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1—HIGH STRENGTH
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All the inherent strength and ruggedness that steel alone provides are combined with long life and definite economies in Crapo Galvanized Steel Strand. Each size and grade developes the full tensile strength of the steel in its complete cross-section. The heavy, ductile, tightly-bonded zinc coating—applied by the famous Crapo Galvanizing Process—affords lasting protection against corrosion, extends the life of the strand beyond the normal period for replacement.

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For this SUBMARINE "DIVINING ROD"

Exact gravity measurements to help locate oil deposits can be made at depths of several hundred feet below water by means of this underwater gravimeter, developed by the engineers of Gulf Research and Development Company.

The electric devices, by which operations are controlled and recorded, include motor operated leveling devices and indicators, light sources for film recording, a motor-operated camera and an alarm system, all within the instrument itself and a control unit containing seven meters, four pilot lights, nine switches, two relays and two motor-driven contactors.

All of these electric circuits are contained in a single Okonite Cable, one inch in diameter, containing 19 conductors. The insulation of each conductor is color coded and the entire assembly is reinforced with 4/64" Okocord rubber over strong mesh braid, which is in turn covered with an outer jacket of Okoprene, containing 60% neoprene, vulcanized to the rubber jacket to form a water- and air-tight bonded protective sheath, resistant to water, air and sunlight.

Designed by Okonite Engineering Service and specially built for the job, this cable represents an example of the kind of problems which our organization is particularly well equipped to handle. Okonite engineers are always ready to consult on any wire or cable problem.

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FOR 3-PHASE 3-WIRE 60-CYCLE
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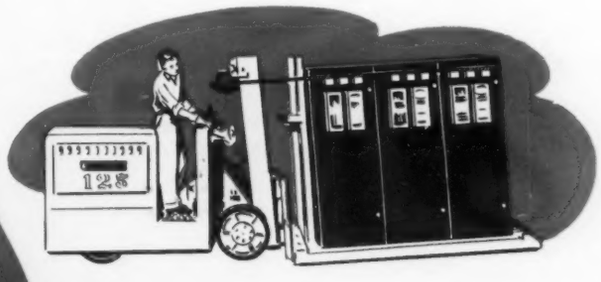
WHEN you need switchgear these days, you want it in a hurry. So we've made it almost as easy to get as picking your favorite coffee off the market shelf. Shipping time for standard low-capacity Type MI-9 metal-clad equipments up to 2300 volts, for protection of incoming lines and feeder circuits, has been reduced from several months to 4 weeks.

And they are delivered in a "package," all ready for you to roll into place and connect the cables.

Again General Electric takes the lead. Only last year we reduced prices 25 per cent on these small and medium-sized equipments. Now, as a contribution to America's big job of getting more *defense* plants ready for production in a hurry, we have speeded up delivery 300 per cent.

Get your switchgear when you need it, this new, easy way. We have sub-assemblies ready and waiting for final assembly, co-ordination, testing, and packing. Just place your order with your G-E representative and we'll do the rest. General Electric, Schenectady, N. Y.



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Isn't it a bargain to invest 1c (the cost of a postcard) to help earning power to which you look forward? American industry is offering a remarkable service—free. ELECTRICAL WEST makes it easy for you to enjoy this service for your own. Check and mail the coupon below. That's all you have to do to help yourself toward better performance and greater rewards.

Protected Transformers (927)

Wagner Electric Corp. has published a bulletin on their protected rural line transformers. The 4-page bulletin illustrates the unit's integral protection against both surges and overloads.

F Lamp Ballast (928)

Jefferson Electric Co. has published a bulletin on ballasts for fluorescent lamps in which complete data is given on ballasts for fluorescent units of capacities of from 4 to 100 watts, including high power factor 2-lamp ballasts. Dimensions and wiring diagrams together with mounting dimensions are given. A section of the bulletin is devoted to lamp service suggestions and data for Jefferson lamp switches and capacitors.

Time Switch (929)

International Register Co. describes in a new bulletin their time switch TS-41, for single cycle operations. The bulletin contains available voltage and cycle combinations and wiring diagrams.

Cable Equipment (930)

T. J. Cope, Inc., manufacturers of tools and equipment for installation of underground and overhead electric cables have a new bulletin illustrating their line and including specifications and data for individual units.

Matthews in Review (931)

Matthews Corp. has published a bulletin featuring the company's line of porcelain-housed cutouts, convertible disconnecting switches and accessories. The bulletin contains specifications for various Matthews units and diagrammatic

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A floor outlet for any type of floor construction.
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Advertising that is read with this thought in mind may provide the solution to a problem that has kept you awake nights.
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- **Better control of friction heat**
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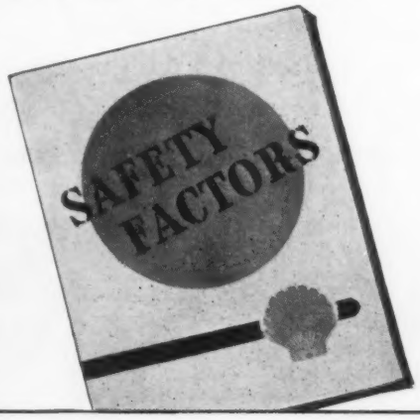


IT ISN'T ENOUGH I should walk into a steel mill engineer who's sour on lubrication "specialists"—he has to take *me* for an "expert," too!

"Look," he says, "I've had so many engineering degrees and textbooks around here, I could start a technical college—*except my engines are still stalling.* You blankety-blank 'specialists' . . ."

"Call me an anything you like," I interrupt—"but *not* a specialist! I'm just a plain, everyday 'S.F.S.'. . ."

"Wazzat?" he barks, puzzled-like.

"Safety Factors Salesman," I come back . . . and spend the next 10 minutes showing him what Shell Safety Factors have done for other outfits.

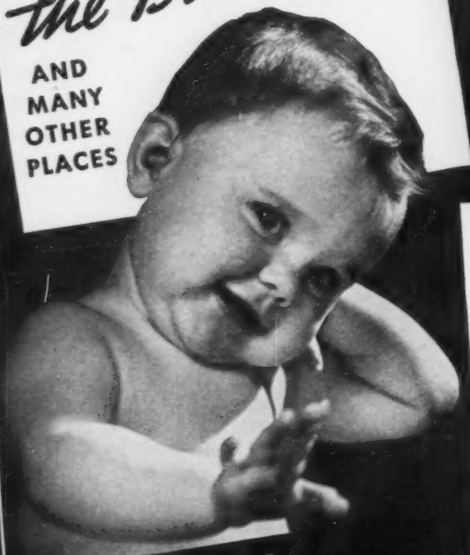
Well, to make a long story good, I call there regular now. And when he greets me with "Say you old 'S.F.S.'—see what you can do with *this* one"—I just laugh. 'Cause I know there's nothin' Shell's Safety Factors can't accomplish!

Your Shell Salesman

I'm gonna help you sell Arvins this Year!

Essential for the Bathroom

AND MANY OTHER PLACES



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Deluxe Model 201A illustrated. Ivory enamel finish, maroon trim. Chrome grille. Toe switch and glow light. 12" tall, **$10.50**. Model 201, same design and size with tan finish **$9.50**

Standard Model 101. Smaller size 10" tall. Green enamel finish **$7.50**

Sold by hardware, electrical, department and other stores. If you don't find it, any model will be sent prepaid on receipt of price.

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Deluxe Model 201A above. Ivory enamel finish, maroon trim. Chrome grille. Toe switch and glow light. 12" tall. List **$10.50**

Model 201, same design and size with tan finish, brown trim. List. **$9.50**

Standard Model 101 at left. Smaller size, 10" tall. Two-tone green enamel. List **$7.50**

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Circulates Heat—employing efficient fan-distributing principle so widely used today.

Portable—plugs in any 110 AC, 60 cycle outlet. Safe with children. Motor does not interfere with radio.

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are appearing in all the leading national magazines shown at left—reaching millions of people—helping you to sell the many prospects in your community.

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ARVIN FAN-FORCED *Circulating Heaters*

sketches showing the connections and features of each. Pictures of the products with descriptions are also included.

Cast-to-Size (932)

Describing and listing their cast-to-size connector for use with square copper tubing, a bulletin issued by Delta-Star Electric Co. illustrates foundry methods and also cut-away view showing point-by-point contact embedations of high pressure contact areas at the square tube corners. Dimension data are given for tubes from 2 in. to 8 in.; wall thickness from 1/8 in. to 3/8 in.

Portable Substations (933)

Portable substations to meet the current demand for emergency power are featured in an 8-page booklet of Westinghouse Electric and Mfg. Co. Units with voltage ratings up to 69 kv. and capacities up to 4,500 kva. are discussed. The various parts that make up a portable substation are pointed out with arrows on opposite side views of the same unit. Special core and heat exchanger features and "forced-flow" cooling are described with a note on automatic protection.

Socket Screws (934)

The Bristol line of socket screws is described and illustrated in a catalog released by the Mill Supply Division of that company. Specification details, prices, sizes and materials, including information regarding heat treatment, are included in the catalog.

Insulating Varnishes (935)

John C. Dolph Co. have a new 40-page illustrated catalog describing insulating varnishes and compounds, their physical and electrical properties and their applications. According to the company, the new issue has a number of new materials which did not appear in the previous catalog.

D. C. Motors (936)

Direct-current motors for service in mines, mills and general industry are described in an 8-page booklet of Westinghouse Electric and Mfg. Co. Several recent improvements; namely, sealed-sleeve bearings, rigid frame-and-foot design, directed ventilation, and adjustable brush-holders are discussed along with a pictorial description of each.

Power Fuse (937)

Schweitzer & Conrad, Inc., describes and illustrates a Type SMG power fuse for extra-high voltage service and heavy interrupting duty in a recent bulletin. Illustrations included show the complete glass fuse with a replaceable refill unit, and another view shows the indicating feature so that blown fuses may be easily detected from the ground. Diagrammatic sketches show the complete details of construction and operation, and complete data on all capacities are given in tabular form. These fuses are made for use on systems the voltages of which range from 46,000 to 138,000.

Engineering Data (938)

General engineering data including operating characteristics for various standard size flexible bearings are given in the new 8-page folder issued by Harris Products Co. Data includes the radial loads, radial and axial deflections, rubber wall thicknesses, etc., of stock sizes from 1/8 to 5 in. diameters.

F Line Shown (939)

A colorful 50-page catalog has been published by the F. W. Wakefield Brass Co. showing their fluorescent and incandescent equipment line. One of the interesting features is a simplified method of calculating the number of luminaires necessary to light a room at a definite level of illumination. Pictures of installations, diagrams and cutaways, together with design data and specifications complete this product presentation.

EASY WAY TO GET INFORMATION

To keep posted, simply circle the items in which you are interested, cut out the coupon (it can be pasted on the back of a postcard) and mail to:

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Please send me the following CIRCLED items:

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922	923	924	925	926	927	928	929	930	931	932
933	934	935	936	937	938	939				

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KLIPLOK CLAMPS
Lock fuses and clips together

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With genuine fibre tubes (not paper)

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The color tells the size

FUSE PULLERS
Pull and replace fuses safely

OILERS
Glass and Unbreakable types for every application. Stops guesswork - bearing failures- waste- idle machinery, etc.

WRITE FOR FOLDER No. 300

TRICO FUSE MFG. CO., Milwaukee, Wis.

M. L. Woodard, 367 9th St., San Francisco
W. E. Young Co., 1944 Broadway, Denver

Sell PORTABLE ELECTRIC HEAT by THERMADOR

FOR GREATER FALL PROFIT

Feature this fast selling, long profit line for fall — Attractive, Dependable, Modern, Economical—and needed in every home . . . Order from your jobber NOW!

Seven Leaguer, (L.P. 131) weighs 14½ lbs. has extra long cord for easy moving throughout home. Attractive finishes in morocco brown or ivory. 1320 watts, 120 volts, A.C. or D.C., Height 39¾ in. Base Diameter 10 in.

Spred-Ray, (MP 121) radiates heat in large arc. 1250 watts, 120 volts, A.C. Chrome Top, duotone brown base and grille. Equipped with 6 feet of cord and spring action plug. Height 17⅛ in., Width 10 in., Depth 10 in.

Heat Fan (HF 161) Warms in winter, Cools in summer —Available in white or morocco brown. 1650 watts, 115 volts, Height 11⅜ in., Width 9¾ in., Depth 5⅝ in.

THERMADOR

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MAGAZINES
in quick review

Qualified Contractor for August contains the full text of a memorandum of agreement between representatives of government agencies engaged in defense construction and the building and construction trade department of the A.F. of L. relative to subletting of specialist work.

☆

"It's Easy to Iron With an Ironer" will be another of *McCall's* magazine appliance pages in its Sept. issue. Illustrated with four different types of ironer, it stresses the four more obvious benefits of an ironer in the home in question and answer form. Would be an attractive paste-up for window display or in the store, for it is in two colors and well illustrated.

☆

"San Francisco Is Re-wiring" in the August *Electrical Contracting* tells the electrical contractor's place in the industry-wide campaign for re-wiring of commercial buildings. "Construction Work for Power Companies" surveys contractor possibilities in this field.

☆

NEUTRALIZING TRANSFORMERS is an engineering report by the joint subcommittee on development and research of Edison Electric Institute and Bell Telephone System. The report describes two types of neutralizing transformers, one developed for use on communication circuits serving power stations, the other for reducing the effects of low-frequency induction on open-wire telephone lines. Data are given whereby the effectiveness of these transformers can be determined.

☆

STATE COMMISSION JURISDICTION AND REGULATION OF ELECTRIC AND GAS UTILITIES, Federal Power Commission, FPC S-10, 25c. Gives results of its survey of nature and extent of regulation by state agencies under existing laws. Data in text and tables, verified by state commissions prior to publication. Contents include: privately owned, municipally owned, electric and gas utilities, and other utilities. This 51-page report was compiled to meet administrative needs of Federal and state agencies.

☆

POWER STATION CHEMISTRY is a report by the power station chemistry subcommittee of the prime movers committee, Edison Electric Institute. This report presents member company statements on the determination of hydrogen evolution in high pressure boilers. Also included is a discussion and operating record of a member company installation of carbonaceous zeolite water softening equipment.

☆

LESSONS IN ARC WELDING published by Lincoln Electric Co., 50c. This book is a compilation of accumulated welding instruction information from the Lincoln Welding School, which has been in operation for 24 years. The book runs 176 pages with 170 illustrations, including photographs and drawings. It is a standard text for industry students and engineering colleges and universities and vocational schools. Presented in a series of 60 lessons, the methods of arc welding are concisely given and fundamental facts of welding explained. A set of questions and answers for each lesson is also included in the book.

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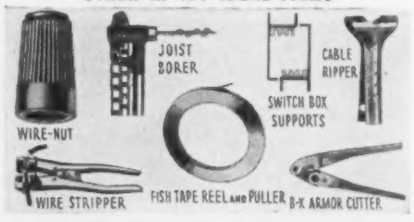

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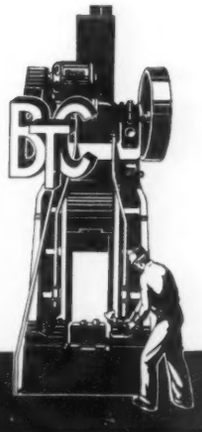

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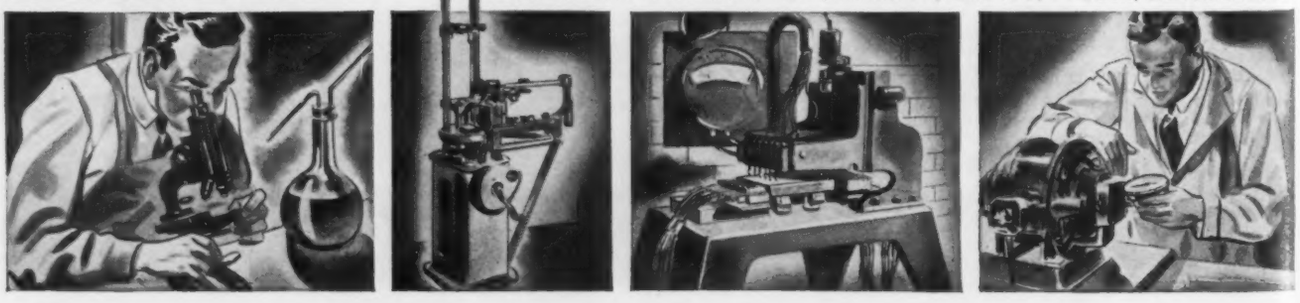

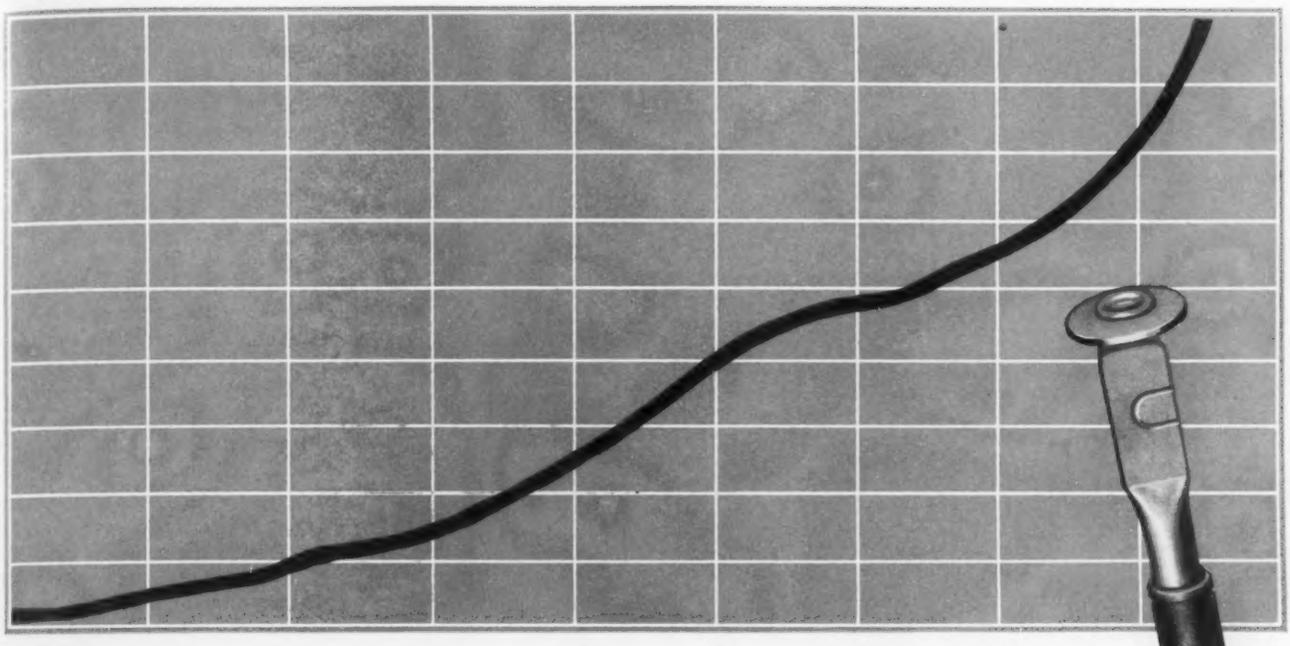

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ELECTRA'S HUSBAND

Salesman's Vacation

JIM SPELVIN is one of the best salesmen I ever knew. For years he has led or been right up next to the top of the list of men who travel for his wholesale house. His personality is way over on the extrovert side. He radiates enthusiasm. And his knowledge of the problems of his customers as well as how the lines he handles could help those customers solve their problems is incomparable. With him it has never been "What can you do for me?" but always "What can I do for you?" So I was surprised when Electra and I met him on the street up in one of the Valley towns with a dejected look on his face.

"Come on in and get a cold drink," he said, pointing to a place with a big "air-conditioned" sign. "You are just the guy I want to talk to." After the boy had set two cokes and a sour lemonade on the table in front of us, Jim cut loose.

"What's going to happen to all the salesmen like me?" he asked. "Is the national emergency going to liquidate us just like Hitler has liquidated a lot of Europeans? I'm getting sick of telling my customers that we're oversold, that material shortages have stopped a lot of our suppliers from shipping to us, and that before long there will be a lot more of the same. I can't take an order from a contractor unless he gives me a job priority of A-1-c or better. I made my year's quota of business in seven months and I could sign that much more again if the house had the goods to ship. No kidding, I've got customers that are passing me the cigers or buying me lunches in the hope that I can get them stuff or speed up some deliveries. Mister, it's getting me down."

"That kind of phenomenon deserves some sort of a celebration," Electra said jokingly. "Why don't you take a vacation?"

"Lady, you don't know how much truth there is in that statement," Jim cut in with just a trifle of bitterness in his voice. "That's just what I'm afraid of—an enforced and protracted vacation. I know how the boss must be thinking. Costs going up, taxes too, shortages of stocks, buyers clamoring for every foot of wire or conduit, every refrigerator or range, every box, fitting, switch or tool we can get. He's going to say, 'Hell, we don't need any salesmen!' And maybe he's right. Then where will I be?"

"Right where you've always been," I answered with as much assurance as I could put into my voice, "serving your customers in new ways. The day will never come when good salesmen won't be the important people in business."

"Oh, yeah," he said. "Well come on down the street with me while I tell Joe Blank that he can't have any more refrigerators for two months. Hear what he'll say about salesmen."

And with that he left us.

RIDING down toward the Bay late that afternoon, I began to think back on our conversation and wonder how many sales managers have made plans to cope with salesmen in Jim's predicament. I wondered what I would say and do if I were a sales manager charged with the responsibility of allaying the fear brought on by the as yet invisible handwriting that many salesmen are seeing—the expectation of being let out.

Two things seemed self-evident. The first would be to assure and re-assure every one of them personally, both verbally and in writing that our company had a policy and would follow it to the letter. Come hell or high water, we would keep our sales force. I'd say it in about that blunt a language so there could be no misunderstandings. If the salesmen were as much at sea as Jim Spelvin had been, then this ought at least to give them the assurance needed to kill off their fears for the future.

The second would be to work out a plan of constructive operation that would keep them busy and make them *useful to our customers.* One of the first things would be to tell them to talk frankly to our customers and future prospects so as to allay their doubts, explain conditions to them and foster confidence and goodwill. Another thing they might do is to study the customer's needs particularly in the light of the situation affecting their own organization. They could help him find substitute materials and appliances. They could assist in training his manpower. They also could perform any one of many sales tasks that are rated desirable but are set aside year after year because of lack of time. In fact they could continue to serve, which is what a good salesman should always do.

Electra has a way of summing things up. We were almost home when she mused:

"If this national emergency should knock out the salesman, with him will go the American way of life."

EVERY so often Electra receives a letter from some reader of this periodic effusion. Here is the latest one:

"Dear Electra: Couldn't you induce your literary husband or even perhaps the editor of the journal that publishes his scribblings to devote a page or even a column to methods of cooperation between stockholder-owned utilities and municipally-owned utilities, in which we all as an industry could profit?

"Isn't there some way in which our problems—so much alike—can be solved for mutual benefit? I'd be willing to talk about my troubles if others will honestly do likewise."

Author is the manager of a small municipal system in a region where the tentacles of the federal bureaucratic power octupus are slowly encircling public and private system alike. To these bureaucrats there is nothing sacred about individual rights, local rights, or even states rights—particularly if these stand in the way of the accomplishment of their ultimate aims. While the operators of municipal and private systems may differ on the fundamental question of ownership, they certainly can agree on many other phases of operation. One of them is opposition to the continued encroachment of the federal bureaucrats. Maybe this is the time for a little more cooperation along that line. In the eyes of those imbued with federal control of electric power there is no difference between a privately or a municipally-owned system.

ONE of our salesmen friends who has always doubted the value of the many reports that salesmen must make out, is now convinced they are worthless. On a recent report that listed the name of a top customer of his firm, he wrote in the place for "Remarks": "I'll buy the lunch for the first man who reads this report." He bought a lunch for the clerk who files them, despite the fact that this particular report bore the initials of two sales executives.

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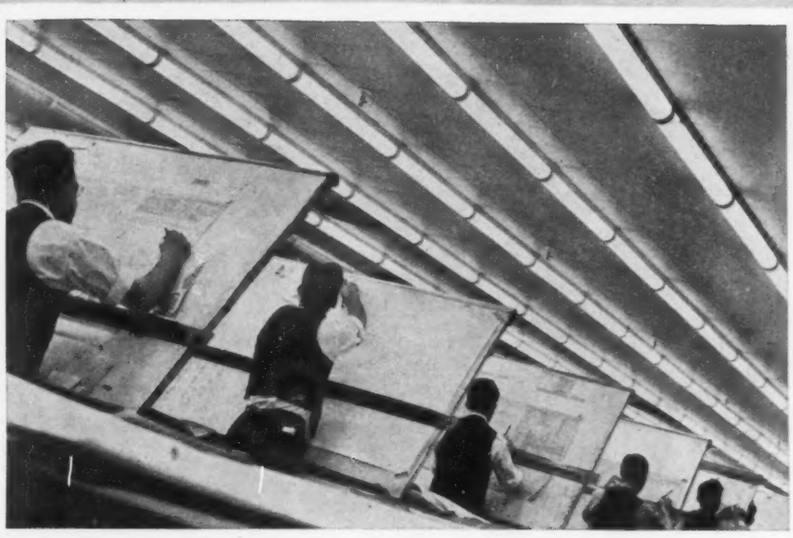

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GENERAL ELECTRIC

ELECTRICAL WEST

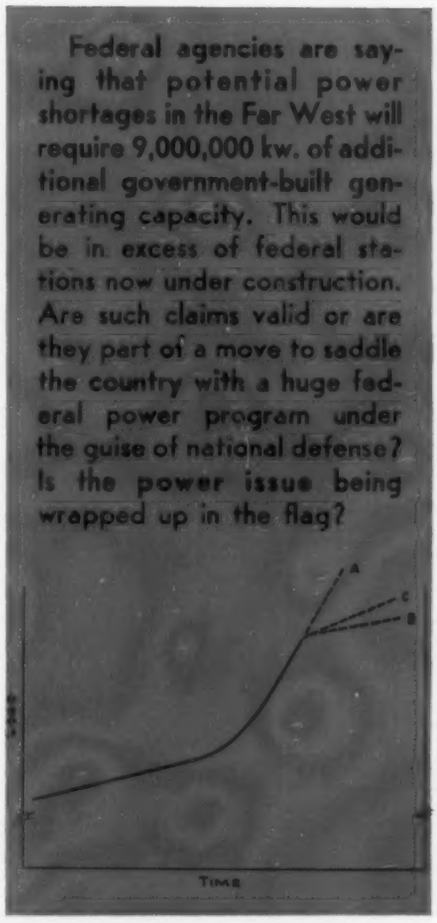
SEPTEMBER, 1941
VOL. 87 NO. 3

WHAT ABOUT A DEFENSE POWER SHORTAGE?

ELECTRIC POWER is one of the two essential ingredients—power and labor—which enter into every part of the national defense program. Power is, however, only an agent in the manufacture of other products, and under no circumstances a *thing* complete and useable such as is a munition, armament or industrial commodity. Power is solely a service along the way. The extent of its necessity follows the establishment of the means of producing the airplanes, tanks, guns, ships, ordnance and the materials which enter into their fabrication.

During the past 20 years, the electrical industry as perhaps no other has constantly reported its plans and capabilities to the War Department and has built its power plants in advance of all industrial needs. However, the sudden development of the present defense program plunged the entire industrial economy of the United States into a state for which adequate preparation had been seriously lacking. As yet, however, power facilities have not been found wanting except in those areas in which development during recent years has been arrested and dependence put upon the large multi-purpose Federal hydro projects.

Nevertheless, the electric power industry is being held up as a target for criticism and condemnation for its failure to provide for defense power demands. Alleged power shortages and deficiencies are pointed to as a defense argument for advancing the pet hobbies of various proponents of government power. Latest power program to be wrapped in the flag and presented to Congress under the guise of a national defense "must" is that outlined by Acting Commissioner H. W. Bashore of the USBR, phases of which are set forth in the accompanying tables. For the region west of the Mississippi River, Commissioner Bashore estimates deficiencies of 902,000 kw. for 1943, 2,018,000 kw. for 1945 and 2,455,000 kw. for 1946. These deficiencies represent estimates over and above scheduled increases in generating capacity for the region as now set up by the utility industry and the federal agencies in their program of scheduled installations.


Federal agencies are saying that potential power shortages in the Far West will require 9,000,000 kw. of additional government-built generating capacity. This would be in excess of federal stations now under construction. Are such claims valid or are they part of a move to saddle the country with a huge federal power program under the guise of national defense? Is the power issue being wrapped up in the flag?
A
C
B
TIME

"Responsible agencies studying the power markets and demands," Acting Commissioner Bashore has said, "have provided estimates of potential deficiencies in power in western areas as follows:

"Pacific Northwest: In addition to present capacity and all that which is now scheduled for installation, a deficiency of 900,000 kw. by 1945 and 1,200,000 by 1947.

"Southern Oregon: By 1945 a deficiency of 60,000 kw.

"Northern California and northern or western Nevada: Even after completion of the Central Valley project and the 150,000-kw. steam plant planned in connection with it, as well as other scheduled installations, a deficiency of 183,000 kw. will develop by 1945 and of 337,000 kw. by 1947.

"Pacific Southwest including southern California, Arizona and southeastern Nevada: After all scheduled installations at Boulder, Parker and Davis (Bullshead) dams on the Colorado River and other scheduled installations, deficiencies of 250,000 kw. by 1945 and 375,000 kw. by 1947 are expected.

"Utah-Idaho: Deficiencies of 75,000 to 125,000 kw. by 1945 and from 150,000 to 200,000 kw. by 1947.

"Colorado - Wyoming - western Nebraska: Deficiencies of 50,000 to 75,000 kw. by 1945 and 75,000 to 125,000 kw. by 1947.

"Montana: Definite figures are unavailable, but shortages are apparently imminent."

To meet these alleged deficiencies, Acting Commissioner Bashore proposed to a Senate committee a Federal construction program involving installed capacities by years as follows:

Year	*Installed Kw.*	*Firm Kw.*
1943	656,000	576,000
1944	2,011,000	1,062,000
1945	2,495,000	795,000
1946	2,947,000	1,163,000
1947	985,000	430,000
Total	9,004,000	4,026,000

A list of potential projects from which definite selection could be made was submitted (see accompanying tabulation). No estimate of cost was offered

but it was emphasized that completion by the time indicated "presupposes immediate authorization, adequate funds, and high priorities in equipment and machinery."

A 9,000,000-kw. program for the West for the years indicated presupposes that the defense program is going to be still expanding after 1943 at a rate that equals or exceeds the present degree of expansion. It is difficult to believe that such is to be the case. More than likely, the power needs of the defense program by that time will be met by drastic curtailment of production and consumption of non-defense goods if the country is to avoid runaway price inflation. Such a displacement of power requirements should more than offset any continuing increase in power needs for the defense program. Consequently, there appears to be ample reason to view the proposed Federal construction program as a move to saddle the country with a great increase in federally-owned power plants under the guise of meeting defense needs.

If there are potential deficiencies in power in the western area, then those who know the future requirements that will develop these deficiencies are keeping the matter strictly to themselves. The western electric utilities, both private and municipal, have always anticipated load requirements of their areas by from three to five years. However, with the lack of planning and of information as to the ultimate goal of the defense program, it is virtually impossible to make any intelligent guess as to future power requirements. This can be illustrated by the accompanying diagram,* which is presumed to be a load growth curve plotted on semi-logarithmic paper so that a constant slope indicates a constant rate of growth. The solid part of the curve indicates the growth which has taken place up to the present, including a rapid rise to represent the advent of defense loads. In this interpretation defense load is meant to include all elements of the re-armament program, including not only actual defense industries as such, but likewise naval shore stations, aviation fields, military camps, cantonments and the increased domestic and commercial loads which these have brought in their wake as secondary but very definite effects. For example, during the early stages of a defense unit, there is a marked influx of building trades mechanics who bring in their train commercial and other organizations to take care of the increased business in the community resulting from the large additional payroll. Later the building mechanics are replaced by factory workers if the plant under construction is a defense factory, or by the military personnel including officers' families, if it is a cantonment or air field. The combination brings a rapid growth of load.

Again referring to the demand curve, the dashed section which follows the initial rise is a part of the curve that may be closely calculated from the known data respecting the defense industries actually under way, again using this term in its broadest sense. In other words, it is possible to judge from the scope of the plants and the camps under construction or just beginning operation, what their total loads are likely to be, and what residential and commercial loads they will bring in their train. Hence, this next part of the curve can be estimated with a moderate degree of accuracy. It might even be possible to plan the installation of new generating equipment upon this part of the curve.

Program of Scheduled Federal Power Installations in the West

Plant	Date	Capacity (Kw.)
Grand Coulee	Aug., 1941	108,000
Bonneville	Aug., 1941	54,000
Grand Coulee	Dec., 1941	108,000
Boulder	Dec., 1941	82,500
Parker	Dec., 1941	30,000
Bonneville	Jan., 1942	54,000
Parker	Jan., 1942	30,000
Parker	Feb., 1942	30,000
Grand Coulee	March, 1942	108,000
Boulder	July, 1942	82,500
Bonneville	Jan., 1943	54,000
Grand Coulee	June, 1943	108,000
Bonneville	July, 1943	54,000
Parker	July, 1943	30,000
Green Mountain	July, 1943	21,600
Grand Coulee	Aug., 1943	108,000
Bonneville	Sept., 1943	54,000
Keswick	Oct., 1943	75,000
Bonneville	Dec., 1943	54,000
Shasta	Jan., 1944	375,000
Fort Peck	Jan., 1944	35,000
Davis (Bullshead)	Jan., 1944	180,000
Anderson Ranch	Jan., 1945	20,000
Colorado-Big Thompson (6 plants)	1946	160,000

However, where the curve goes from this particular point is what is worrying the power industry and it is here that some governmental departments presumably go farthest astray. They seem to feel that the future growth will be along the dotted line toward "A." A more conservative survey of the situation might suggest that the curve will take the course toward "B," paralleling the original normal community growth. Or a compromise study might indicate a course to some intermediate point slightly above "B" such as "C."

The best idea of what a continued growth toward "A" would involve may be obtained by examining what has occurred to date in some of the western communities where the defense program has already impinged to a marked degree. San Diego is a fair sample. Continued growth of the order indicated would require a duplication of the Consolidated Aircraft Corp., so that instead of employing 32,000 as is expected by next winter when the new parts plant is completed, the organization would employ 64,000. Twice as many dredges would have to be at work in San Diego harbor, although they are now with the present dredges completing in two years, what was once to have been a 10-year program. All of the military camps and the naval shore facilities would have to be doubled so that instead of having 35,000 service men and their families in the vicinity, there would be twice that number. Various defense housing authorities have built or are building over 6,000 single-family housing units. It is estimated that 5,000 more are being built as private ventures. These, too, would have to be doubled.

It is easy to imagine what all this would mean to the various municipal facilities—streets, transportation, sewers, water, schools and others of a like character—already strained to capacity. Yet all of these things would be necessary if the defense power requirements are to continue toward point "A" on the curve, which is the contention of the government agencies that have propounded the doctrine of huge power deficiencies.

But there are other obvious difficulties. If the factories now under construction or rapidly reaching completion are strained to the limit to secure the necessary skilled labor and supplies, how are the new factories which are to double all output presently in sight to secure their necessities? Who will gamble on building more homes, theaters, office buildings, stores and the like to provide the secondary expansion? How will transportation facilities be provided for both raw materials and finished goods?

The provision for an abundance of power must follow earlier planning for the construction of plants, the securing of qualified labor, and even more important, the delivery to the selected locations of raw materials and the shipment therefrom of semi-finished or finished products to the point of fabrication and ultimate use. Any authority declaring power needs or predicting power deficiencies must have available reasonably complete information as to the future plans and provisions for these other factors of production.

It would seem the first requirement is that the government tell the industry what size army is to be equipped, and how many defense factories are going to be built over and above those recently completed, now under construction or already authorized. It should

* Page 27.

tell what new cantonments will be authorized and where; if the power industry does not have these facts, how can it plan construction programs to serve loads that may not even come to its service area?

The sole qualification that might be made with respect to these arguments is that certain electro-chemical or electro-metallurgical industries, such as aluminum and magnesium, will require large amounts of power per unit of labor employed. Such cases do require special consideration with respect to the power demands of the areas in which plants are to be situated. However, these should not be used as typical examples to determine whether or not the power demand of a whole state or a whole region is to be toward "A," "B" or "C" on the curve that has been discussed.

What is needed is a more careful analysis of the loads to come—where they are coming from and why—and less of the easy but dangerous indoor sport of extrapolating demand curves. A coordinated analysis should reveal what the facts are. Merely to predict that so much power will be required, without statements as to the industry that will utilize this power, is foolhardy. An overall analysis would include suitable deductions for the other industries and activities that will inevitably be curtailed through lack of trained men and materials, if the war industries are further expanded. It would make amendments for the communities which will be partially abandoned if the blitz towns are to be filled up with workers, for these workers must come from somewhere. It should take cognizance of the probability of more shifts and longer hours, thus increasing power output without increasing power demand. It should take into account a reduced demand per residence customer, as the new small units of the housing projects begin to function, and as it becomes increasingly difficult to secure energy-consuming appliances because of material shortages.

Because the capacities of some governmental hydro plants are being absorbed in the present emergency, the charge is also being made to the effect that the power industry was short sighted in the past and is likely to duplicate this performance in the future. The statement is frequently heard, "Where would the country be today if the government had not constructed the blank hydro-electric project?" The electrical utility industry can answer that question. The nation would be exactly where it is now as regards power capacities, or perhaps even somewhat better off. Had the government not constructed the projects, some power company would have built a similar one or possibly a more dependable steam plant. Nothing is ever said about the power industry having stepped aside in its construction program so that the output of these government plants, particularly those with honest multi-duty purposes, might be absorbed by the community load growth.

For government agencies to initiate a struggle for the control of the power industry under the cloak of national defense, thus further engendering suspicion between groups, will simply make future planning difficult. There will be too much politics and too little engineering. The cooperative spirit with which the various elements making up the power industry met threatened or actual shortages from war and drouth in the past, will be replaced by distrust and lack of candor. Yet if power development is to be efficient, it must be effected by a cooperative effort of all of the producers in each area. The electrical industry may be counted upon now and in the future to continue fully to meet the loads to be imposed upon it and asks only that it be taken into the group around the planning table and that it be given freedom from harrassment and assurance of a fair field in which to operate. Throughout the length and breadth of the land, there is no group more imbued with loyalty to country or more determined to support the fundamental principles of freedom and personal liberty than are those engaged in the operation of the electric utilities. Potential power shortages in any area can and will be met in ample time if this group be afforded opportunity to join in the complete defense plan, and be permitted to finance and to build the electrical facilities which are needed as a part of the whole scheme of defense production.

Proposed List of Western Federal Power Projects

Year (1)	State	Project	Stream	Plant	Rated Capacity (kw.)	Firm Capacity (kw.)
1943	Idaho	Cabinet Gorge	Clark	Grand Coulee		
1944	Wash.	Col. Basin	Columbia		99,000	50,000
				(4 units)	432,000	284,600
1944	Wash.	Klickitat (3)	Klickitat	2 plants	70,000	20,000
1944	Wash.	Snoqualmie (2)	Snoqualmie	2 plants	56,000	24,500
1944	Wash.	Sultan River	Sultan		60,000	26,500
1944	Ore.	Stayton (2)	No. Santiam	Detroit	50,000	25,000
1945	Wash.	Priest Rapids	Columbia		650,000	350,000
1945	Wash.	Stilaquamish (2)	Stilaquamish			
			Deer Creek	4 plants	112,000	42,000
1945	Wash.	Col. Basin	Columbia	Grand Coulee		
				(5 units)	540,000	183,200
1946	Wash.	Col. Basin	Columbia	Grand Coulee		
1946	Wash.-Ore.	Umatilla Rapids	Columbia	(3 units)	324,000 850,000	10,000 180,000
1946	Wash.-Ore.	The Dalles	Columbia	Celilo Falls	420,000	225,000
1946	Wash.	Z Canyon	Clark Fork	Z Canyon	200,000	100,000
1944	Ore.	Rogue River	Defense Gap	Rogue River	30,000	15,000
1944	Calif.	Scott Valley	Scott	Scott	50,000	25,000
1943	Calif.	Steam plant		Antioch	150,000	150,000
1944	Calif.	American River	American	3 plants	130,000	55,000
1944	Calif.	Kings River	Kings	3 plants	146,500	50,000
1944	Nevada	Truckee Storage	Truckee		18,000	9,000
1944	Calif.	Steam Plant		Newark	75,000	75,000
		Steam Plant		Sacramento	75,000	75,000
1947	Calif.	Feather River (4)	Feather	Oroville	225,000	90,000
1943	Calif.	All-American Canal	All-American Canal	Pilot Knob Boulder (2 units)	33,000 165,000	15,000 100,000
1944	Ariz.-Nev.	Boulder Canyon	Colorado			
1945	Ariz.-Nev.	Boulder Canyon	Colorado	Boulder (3 units)	205,000	
1946	Ariz.	Bridge Canyon	Colorado	Bridge Canyon	400,000	200,000
1943	Utah	Steam Plant			100,000	100,000
1944	Idaho	Mountain Home	Scriver-Creek		60,000	30,000
1945	Idaho	Snake River Storage	Snake	Palisades	30,000	13,500
1945	Utah	Colo.-Green Ri.	Green	Split Mt.	75,000	45,000
1946	Utah	Colo.-Green R.	Green	Echo Park	125,000	75,000
1946	Utah	Dewey	Colorado		290,000	130,000
1947	Utah	Rattlesnake	Green		70,000	(5)40,000
1947	Utah	Dark Canyon	Colorado		600,000	300,000
1943	Colo.	Steam Plant	Colo.-Big Thompson	Fort Collins	(6)110,000	110,000
1943	Colo.	Montrose	Uncompahgre	3 plants	17,000	7,500
1944	Wyo.	Kendrick	No. Platte	Kortes	30,000	12,000
1945	Wyo.	No. Platte	No. Platte	2 plants	26,000	11,500
1945	Colo.	Blue-So. Platte	So. Platte	3 plants	90,000	(7)25,000
1946	Colo.	Gunnison-Ark.	Gunnison	Iola Res. and others	60,000	30,000
1944	Mont.	Canyon Ferry	Missouri	Canyon Ferry	50,000	30,000
1945	Mont.	Big Horn	Big Horn	Lower Big Horn	100,000	45,000

(1) Completion possible in year indicated.
(2) Investigated by Corps of Engineers, War Department.
(3) Investigated by Office of Indian Affairs.
(4) Reported in California State Bulletin No. 26.
(5) After upstream storage.
(6) Doesn't include Colorado-Big Thompson hydro plants under construction with installed capacity of 181,000 kw.
(7) Firm power of 25,000 kw. is dependent on completion of entire Blue-South Platte project.

PRIORITIES PLAN INSURES PRODUCTION

Users of industrial supplies and equipment urged to cooperate by providing manufacturer-suppliers with percentage of defense work and private production

OFFICIALS of OPM point to a danger confronting all branches of industry: the flow of tools, supplies and equipment, which every plant must have in order to maintain production, is threatened unless the producers of such items are given priority consideration for their purchases of raw materials—and before priority can be given, manufacturers *must have evidence* that their products are used for defense.

Up to now, this data has been difficult to get because such products are customarily manufactured before they are ordered by the users—to provide, of course, that stock will always be available for delivery when needed. To provide the necessary assistance, the Priorities Division has established the Defense Supplies Rating Plan, which sets up a priority for future business on the basis of past business. Manufacturers granted use of the plan will determine the percentage of their total production that goes into defense channels and will then be given an A-10 rating *on that part* of their material requirements.

Their percentage figures will be determined from information secured from their customers. Hence, they are required to ask customers:

A. To identify orders for items that will be used for defense work

B. To furnish a monthly notarized affidavit stating the percent of defense sales to total sales made by the customer.

These requests are being made in industry now—by the supply manufacturer himself, his sales staff, or by the industrial distributors who represent him in the various territories. This activity has been gaining momentum during the past two months, as more and more supply manufacturers complete the machinery of estimating their defense sales, and A-10 ratings are being issued. As yet, however, not nearly enough A-10's have been issued to those who need them; nor are they being issued fast enough.

One important reason for this delay is that many customers, or plant men, are indifferent or even hostile to the idea of responding to the requests for information coming to them from their suppliers.

Lack of motors, pumps, hoists or even bolts, can cause just as effective a shutdown as will the lack of a machine tool. But a typical attitude seems to be, I've had no trouble as yet and will do something about it at the first sign of trouble. Just now I'm too busy with other things." In this case, where items are manufactured weeks or months in advance of orders, the first sign of trouble comes too late. And manufacturers who are in position to see ahead are fearful of serious difficulties unless cooperation is given now.

There is nothing compulsory about the Defense Supplies Rating Plan for the user of industrial supplies and equipment. But, almost surely, lack of cooperation will be returned with interest in severe production difficulties in the not too distant future.

A considerable program of education to acquaint industrial consumers with these facts is now under way. On this page will be found the example of one manufacturer to make the Defense Rating Plan work for his company and customers.

Short History of Priorities

The priorities system, in the beginning, was a method used by the Army and Navy to schedule their deliveries, both in relation to non-military orders and in relation to each other. In this brief stage, priorities served more as a time-table than as an allocation function. Scheduling of deliveries is still a fundamental function of this system, but now it also insures that scarce materials will be available to those which defense dictates needs them. Army-Navy preference ratings, now issued under delegated authority of the OPM Priorities Division, still represents the bulk of priorities. All military orders for some 300 items (including practically everything used for utility equipment) on the so-called Critical List automatically are given ratings.

At the moment, the drive to spread defense contracts into consumer goods factories is being pushed on two fronts, with electric appliance manufacturers directly involved in each case. Efforts are being made to mesh this plan conversion with production curtailment programs being promulgated by OPACS.

DEFENSE SUPPLIES RATING PLAN

Consumers of industrial supplies are helping themselves each time they fill out an affidavit for their supplier, be he manufacturer or distributor.

This is so because disributors and manufacturers of industrial supplies must have an analysis of not less than 85% of their monthly dollar volume in order to support affidavits and statements made by them to obtain the materials you need.

FOUR STEPS FOR INDUSTRIAL BUYERS TO TAKE NOW

1. Identify Your Defense Orders

i.e. stamp each defense order you place with your suppliers, either distributors or manufacturers, as a defense order using thereon the contract, project or preference rating which covers the particular work for which this material is required.

2. If Such Identification Is Impossible

analyze your sales by determining the percentage of your previous month's total dollar sales volume which was delivered to defense buyers.

3. Obtain Analysis of *Your Sales*

by submitting to your customers the standard approved form of affidavit prepared by the Priorities division of the O.P.M.

4. Users of Industrial Supplies

should obtain the highest possible percentage figure by accurate means of analysis which can be supported.

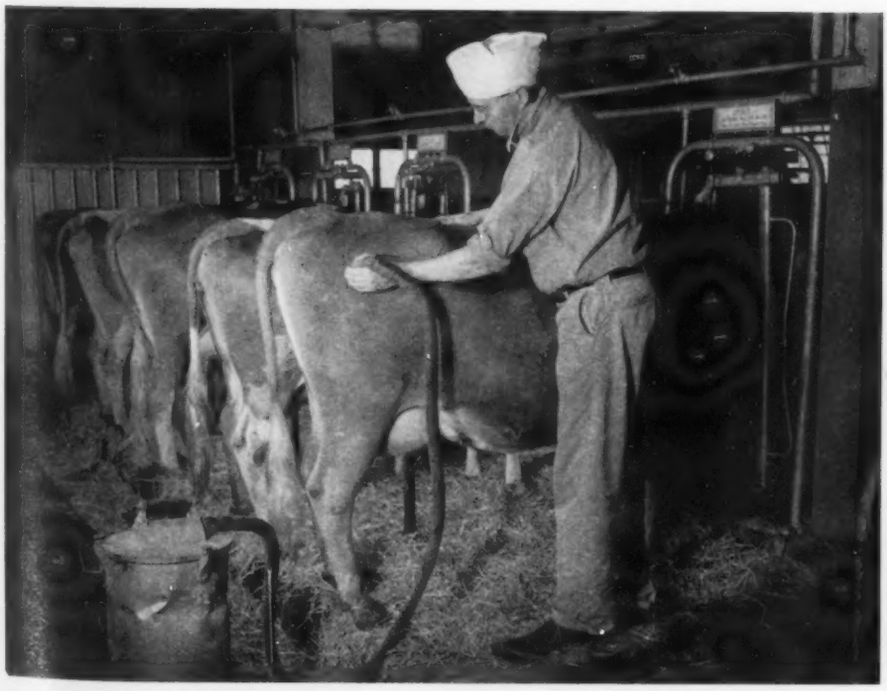
The highest percentage figure consumers can include in their affidavit is of greatest value to distributors. This is so because distributors in turn can supply to manufacturers a higher percentage of their sales for defense purposes.

This assures the manufacturer of industrial supplies that he may obtain the required amount of raw materials to manufacture new products for defense orders in advance of receipt of an order for his products.

Pasture Irrigation Paying Farm Activity

Irrigation of pasture or grass for dairy, poultry, sheep, hogs and other livestock or poultry is a paying farm activity for many Willamette Valley (Ore.) farmers. During the summer and early fall months, egg, milk and meat production declines from spring season gains unless succulent green feed is maintained through irrigation. Experiments by the Oregon State College faculty and experiment station staff have proven several valuable facts: One-sixth acre of irrigated Ladino clover produced enough green feed for 1,500 pullets and 300 laying hens during the summer season. An acre of irrigated Ladino clover replaced 3 to 3½ tons of grain in a ration for pigs. One acre of Ladino clover, after deducting the grain fed, produced 315.3 lb. of lamb on ground which would practically have no yield during the dry months. One acre of irrigated Ladino furnished as much in feeding value for beef cattle as 9,550 lb. of alfalfa hay. An acre of good irrigated grass and Ladino pasture furnished about 70% of the feed requirements of two cows producing about 30 lb. of 4% milk daily over a six-month pasture season.

Above: Portable motor driven pumping unit of the type developed for summer irrigation in Oregon. Below: Dairyman Moulton using electric hand vacuum cleaner on his registered milk-and-dandruff producers. Lower milk bacteria count is another important result of tri-weekly electric grooming.



Dandruff Dividends for Electric Dairy

Immaculate bovines aid hay fever, asthma victims; add revenue for enterprising electric dairyman

Likely contender for "unusual sideline" champ is dairyman Art Moulton, owner of the Middale Guernsey Dairy near Vancouver, Wash. Moulton vacuum cleans his registered cows and sells the *dandruff* for 25c a lb. An electric vacuum cleans the 36 Guernseys every other day, and during some seasons of the year three weeks is required to obtain two lb. of the cleanings—so there is no staggering fortune to be made from this collection. But, more prosaically, vacuuming keeps cows cleaner, resulting in a lower milk bacteria count at well as improving appearance of the herd. Vacuum used is a built up pail type of container with two suction fans at the bottom. A suction of air removes the cow dandruff and deposits in a dust bag. Oh, yes . . . the dandruff is sold to two Portland, Ore., physicians who use it in a hay fever and asthma compound.

LIGHTS UP!

The trend is upward in lighting man activity as pictured in these

"V"—for vision, visibility and victory. More than 50 cool, even, and maintained foot-candles here in the small parts department (shown at upper left) of Vultee Aircraft Co., Downey, Calif., aid craftsmen to see properly and do accurate work without loss of time and waste through error. System consists of 92 Benjamin RLM 3-lamp fluorescent units. F-lamps used are G-E Mazda 36-inch daylight tubes. Installation was handled by W. Trent German of Southern Calif. Edison Co.

☆

Night view at left shows a portion of lighting system in operation at Camp Haan, new anti-aircraft firing training center near March Field, Calif. Pendant street lights used are a type recently developed by G-E engineers to provide more accurate control of light distribution and resulting ground illumination. 262 of the lumainaires (Form 79-VR) with 500-watt incandescent lamps, have been installed 23 ft. above the ground on poles spaced 110 ft. apart and extending the length of the equipment parking area. Main purpose of the lighting system is to aid in night maneuvers, to help in minor repair work, and to assist the guarding of the grounds and equipment. Camp Haan, when completed, will accommodate from 12,000 to 15,000 men for training in anti-aircraft operation.

☆

High intensity mercury lighting has been installed in the plant of Enterprise Engine and Foundry Co., San Francisco, manufacturers of diesel engines currently engaged in defense production. In the bottom picture, the installation of Westinghouse high bay aluminum reflectors, housing 400-watt high intensity mercury vapor lamps, in a main manufacturing aisle is shown. Fifty-four of these Alzak finished reflectors equipped with dust-tight glass covers, give an average of 25 foot-candles on a working plane three feet above the floor. Lamps are mounted in three parallel rows on 15-by-16 ft. centers, 25 ft. above the floor. Forty-three 250-watt vapor lamps in dome reflectors illuminate adjoining low bay areas to an average level of 25 foot-candles. Low bay units are on 12½ by-14 ft. centers 10 ft. above the floor

IN THE WEST

intensities for every phase of hu-
pages of typical installations

Interstate Avenue, Portland, Ore., lighting is shown in the top picture at the right. They are 4,000 lumen units and poles are arranged on 150 ft. centers, but alternated on each side of the street so as to give approximately 75 ft. centers. The units use Servray refractors

☆

Before and after pictures of street lighting in Reno, Nev., shown next, where a new system has been installed on both the cross-town highways. In Reno there are 200 units, each a Westinghouse Reflectolux, with 4,000-lumen lamps, on a 16-ft. mastarm over the street, 25 ft. to light center, on 150-ft. spacing; in Sparks, adjacent, 6,000-lumen lamps were used for 60 units. A ¾-mi. stretch between Sparks and Reno may be lighted later by the county. Virginia St., the main artery north and south, was similarly lighted. Already traffic accidents have been much reduced at night

☆

Night accidents have been reduced 40% over a period of a year at five street intersections in San Francisco, Calif., where four-cornered lighting installations have been made and are being studied. Photo at right center shows one intersection where four G-E pendant-type luminaires are installed. These are mounted 25 ft. to light center on mast arms which extend out over the driving area; 10,000-lumen incandescent lamps

☆

The service station in the bottom picture is in Arlington, Oregon, on highway 30. The operator recently re-lighted his station with two 1000-watt and one 500-watt floods, and uses 1.5 kw. of light inside and on signs. He reports that his business has increased materially. He claims that the increased visibility of his station gives passing motorists a chance to slow down and come in, where before they were on top of the station and past before his wares could be made evident.

LIGHTS UP!

AT HOME

San Francisco home builders are becoming increasingly conscious of the value of adequate lighting and wiring. One of the outstanding new homes to receive an adequate wiring certificate this year was the residence of Dr. J. C. Campbell of San Francisco. In the construction of his new home, Dr. Campbell insisted upon the maximum in wiring and modern lighting in order to achieve efficient lighting and all labor-saving electrical conveniences. Close cooperation between architect, builder and electrical contractor resulted in a home that is the last word in modernity both in wiring and lighting. Installed in Dr. Campbell's new home are 52 lighting outlets, 46 convenience outlets and 48 switches. Switches in the principal rooms are of the silent mercury type. Specially-designed four-tube fluorescent fixtures are used in the living room, dining room, entrance hall and entrance loggia. A badminton court in the back yard is flood lighted. And, there are weatherproof outlets at the front of the house for special lighting during the Christmas season, when San Francisco homeowners vie with each other for the most beautiful outdoor displays. The top picture shows the living room and the bottom picture the electric kitchen. Electrical contractor was W. H. Kirsten. Bob Lindsay of PG and E laid out Red Seal wiring.

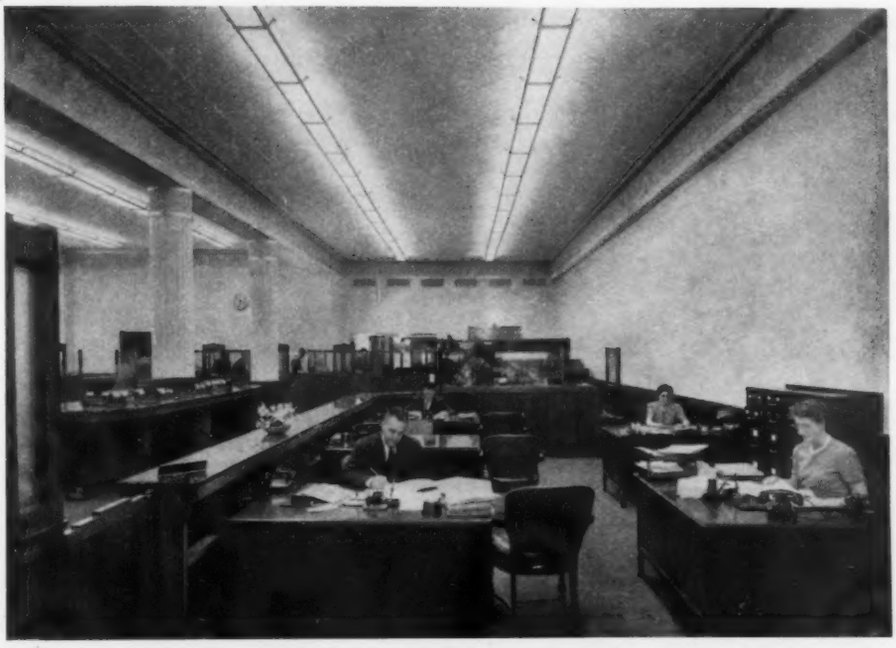
☆

Lighting has made the garden and home yard as useful and habitable by night as by day in summer evenings throughout the West. Popular outdoor home sport is badminton and lighted courts take small yard space that can also be used for outdoor entertaining or other games such as suffleboard. Lately hardly a home in southern California is without such outdoor lighting either for badminton, a barbecue pit or outdoor entertaining. Center picture shows a good installation of badminton lighting, where the 25-ft. pipe standards also serve to support the net. Two 500-watt aluminum reflectors are mounted on pipe goosenecks atop each standard.

IN THE WEST

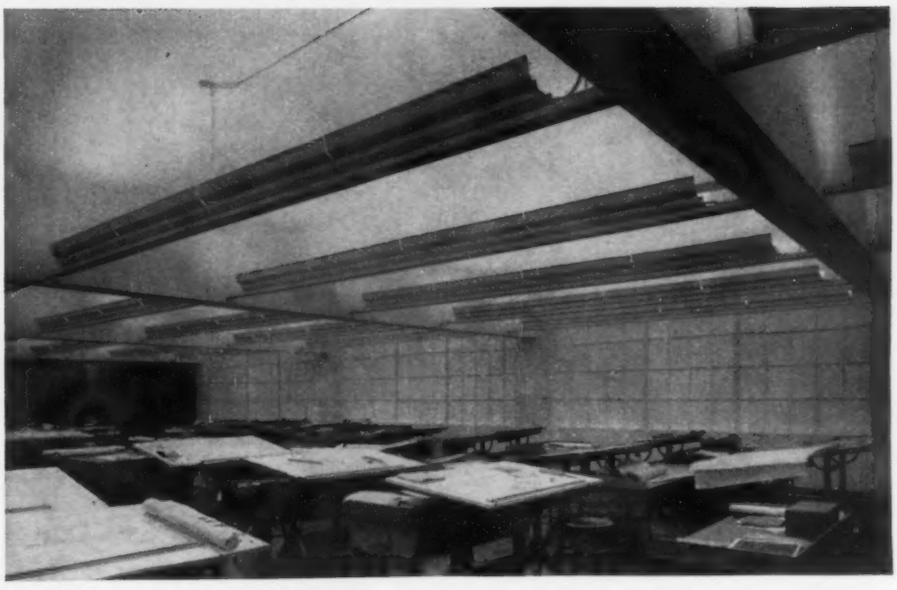
IN THE OFFICE

The importance of good lighting for sales, service and office efficiency is recognized in the excellent installation of the Peoples National Bank of Washington, prominent Northwestern institution, shown in the upper picture at the right. Lighting levels were raised during the modernization work by fixtures of Seattle Lighting Fixture Co. under the direction of Fred Gleason. Area of the bank is 50 x 64 ft. with an 18-ft. by 25-ft. extension on one side of the office area. The ceiling is 16 ft. high. Fluorescent was installed against the ceiling, using four continuous rows of 48-inch 40-watt lamps in each trough; 240 ft. of continuous light was provided, composed of four troughs abous 60 ft. each. Fixtures are constructed of cast and polished bronze with bent glass side panels and Corning control lenses. Spacing is 12 ft. between troughs. Two hundred forty 48-inch F lamps average 2.8 watts per square foot of area; 65 to 80 foot-candles were obtained after the first 100 hours of operation, an exceptional job



☆

Westinghouse open-end industrial fluorescent luminaires designed for continuous strip mounting have been inverted to provide a high level of even, glareless, totally indirect illumination in the pictured drafting room (center picture) of the Enterprise Engine and Foundry Co., San Francisco. Similar units—type 2-FPC-40—are similarly inverted to provide indirect light for a sales office and a general engineering office at the plant. Each unit houses two 40-watt 3500°K white F Mazda lamps. Average illumination level on desks and drafting tables is 31 foot candles. Average mounting height is 9 ft., and rows are 6½ ft. apart

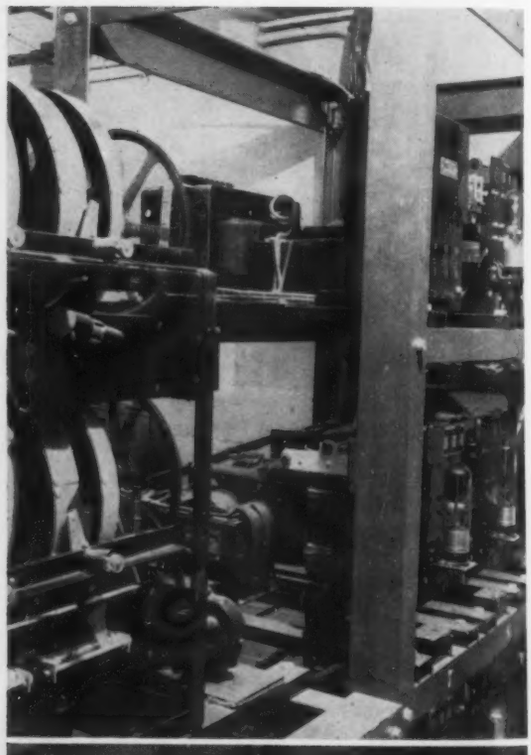


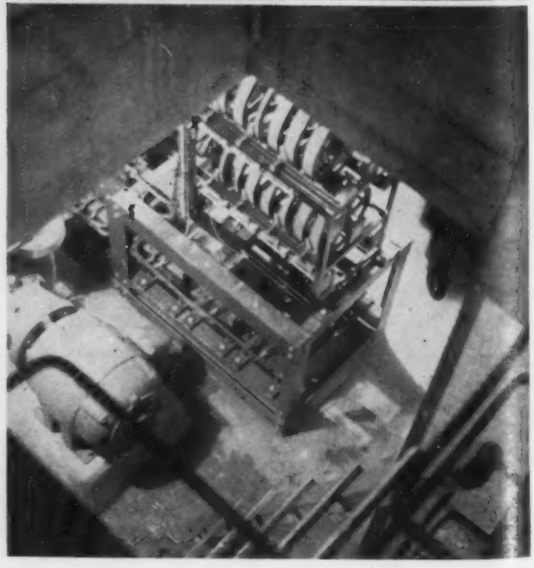
☆

Denver & Rio Grande Western Railroad Co. passenger and freight office at Salt Lake City, Utah, shown in lower view, has luminaires built in continuous lines which conform to the architectural pattern of the room. Two parallel rows of 40-watt white fluorescent lamps are placed in open-top reflectors with crosswise louvres of white metal to shield the lamps from view. Housings and hangers are of bronze. The luminaires were built by Schockett Electric Supply Co. of Denver. Electrical installation was made by Oberg Electric Co. of Salt Lake City. Illumination maintained is 40 ft.-candles.

LIGHTS UP!

Fountains, lovely and graceful as they are by day, are transformed into sheer color magic when illuminated at night. As long ago as the first World's Fair this was recognized and fountains have been used in each succeeding World's Fair upon which to play colored light for evening enchantment. When the fairs close there are regrets that such beauty is lost, but in many communities now the techniques of the fairs are being employed in parks and public grounds to light permanent fountains

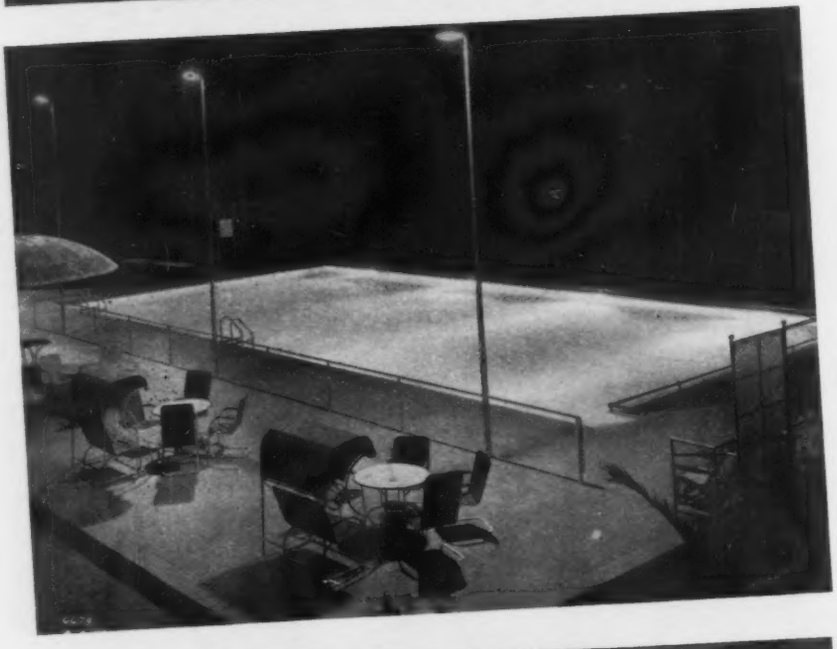




Woodminster Memorial Amphitheater in the Oakland hills has been created in honor of all California poets. It is located on the old homesite of Joaquin Miller. Water pours from three urns and overhanging coves at the base of the ampitheater high on the hill, cascades down 100 ft. through three basins to a final 15-ft. fall at the base and under a walkway to a fountain pool. Here 50 Westinghouse Aqualux underwater lighting units and four heavy duty amber floodlights, with a number of concealed reflector flood lamps, light the facade of the ampitheater, the cascade and water falls and illuminate the sprays of the fountain. Water pattern and light change constantly in the fountain. Heart of the system, shown at the right, is the Ward-Leonard Hysterset. Ten slowly revolving wheels on which are cut-out graphs of brass, energize in required sequence through relays and the hysterset dimming set, the lamps in the underwater units as well as the pumps controlling the center 25-ft spout, four jet spouts with a 12-ft. throw and the 20-ft spray ring. Twenty amber, red and blue underwater units thus change intensity constantly, creating an ever different color and water combination. The remaining lighting units are employed in the cascades and waterfalls. Water is recirculated through the entire system at approximately 1,000 gal. per min. Total connected load is 25.6 kw. Lighting equipment and remote switchboard control used in the Federal Theater during the San Francisco Exposition will be used in the amphitheater on the hill

IN THE WEST

Representative lighting installations from various parts of the West turn up many new ideas. At top, right, Gair's of Redlands, Calif., has an eggcrate window ceiling, each with an outlet. Reflector lamps are plugged in at will to create effects. Redlands Electric installed the job. Below, left, Green Frog Market at Bakersfield, has 36 Remco 4-lamp F units, obtains 43.6 average fc on 11x10 ft. spacing. H. R. Huber designed, H. Gerard installed. Right, Adams Hat Store, in Los Angeles, where 2,300 watts of 3500°K. white F lamps in coffers, louvered, mounted flush in the ceiling, provide 40 fc. An open cornice along the cases houses a continuous row of F lamps which both light the hats and the wall above the case. Designed and installed by Grand Rapids Store Equipt. Co. Second row, below, left, at Spencer's department store corset shop, Vancouver, B. C., indirect coves using 100-watt P40 reflectors on 1-ft. centers supplemented by 25-watt lamps in troughing on walls and in niches on pillars are covered with opal glass. Right, Normart's Furs, at Fresno, earned Roy Baum a rating in PG and E's tough 50 fc contest. It combines sections of 3 40-watt F lamps, two white, one daylight, in Von Hacht special fixtures, between which are 300-watt lamps in back of Corning lens units. Average maintained illumination is 51.2 fc. Bottom of page: Druggists in San Diego at neighborhood centers have found an inexpensive way to make their stores stand out at night. What amounts to sign board lighting, angle reflectors on an extended pipe, floodlights the store. Before and after scenes are shown. Business always improves after lighting



LIGHTS UP!

Bowling, sport of the greatest possible precision and accuracy, demands illumination that keeps the pace with the exacting art of the game. Lighting must be strong with no distortion or glare. In the Berkeley Bowl, Berkeley, Calif., the lighting installation (shown in middle picture) sets an excellent standard for builders of these set-em-up and knock-em down emporiums. Highlights of the job: Alley dimensions, 63 by 90 ft.; area, 5670 ft.; fixtures mounted 22 ft. above the floor; number of lamps, 80; color, white; watts and bulb size, 40 watt F; total watts, 8000. Total fixtures, 40 of two lamps each. Equipment custom made. Chicago Hardware and Electric made the lighting installation

☆

Underwater floodlighting has transformed the pictured swimming pool at the Oakmont country club, Glendale, Calif., into a really beautiful pool during night-time hours, and made evening swims a safe and popular pastime at the club. Eight Westinghouse thousand-watt underwater floodlights mounted 30 in. below the waterline illuminate the 40x75 ft. pool so brightly that tile outline on the bottom are clearly visible. Special feature of the lighting system, designed and installed by the Paddock Engineering Co. in Los Angeles, is its remote control by which lights may be operated from several different positions. This flexible arrangement facilitates smooth control of lighting effects during shows

☆

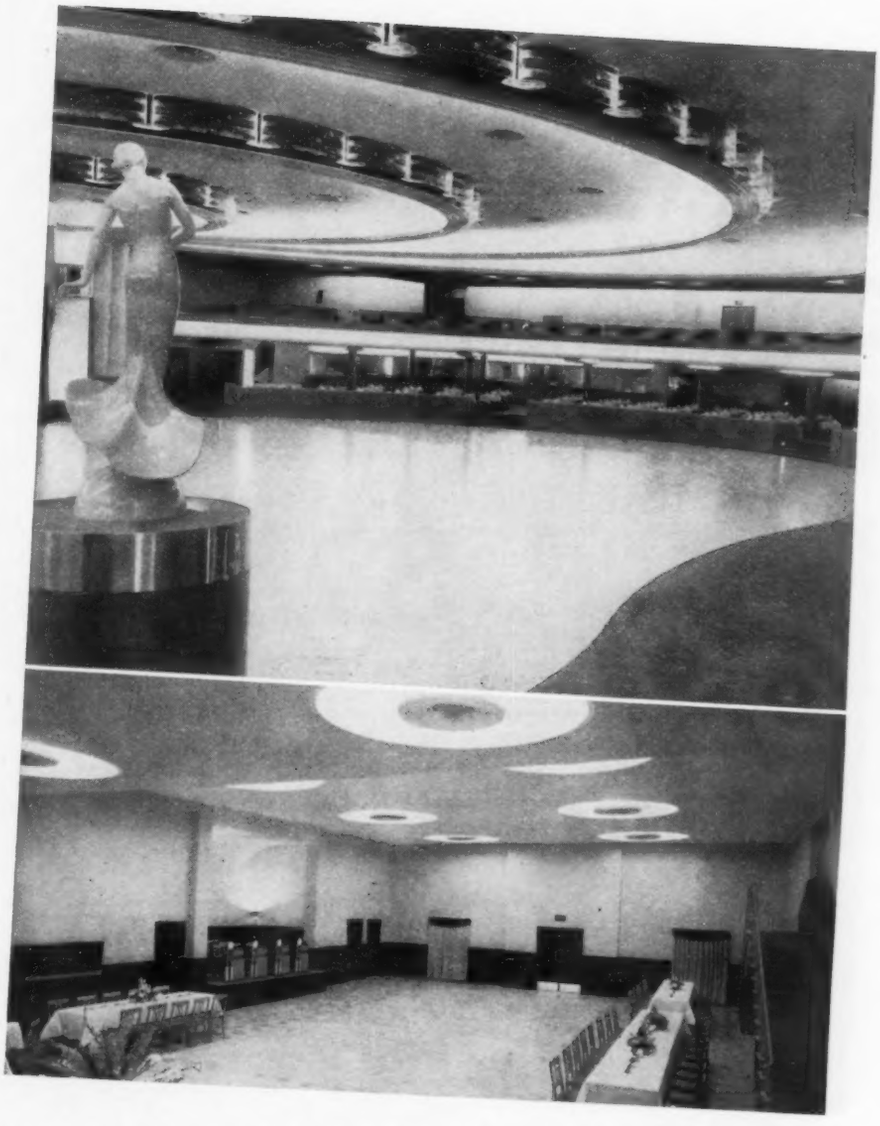
Ice skating, once reserved for athletic Easterners as a winter sport, has won devotees among thousands of Californians to whom the appearance of snow in their own communities is an extremely rare and highly astonishing affair. Playing no small role in this upsurge of interest in the blades, is effective and artistic illumination of the indoor rinks—which take the place of a movie among sun-burned Californians very frequently. East Bay Iceland, one of the largest and finest rinks on the Pacific Coast, has a particularly good lighting arrangement. This Berkeley, Calif., plant has fixtures mounted 32 ft. above the floor, 45 lamps, 24 500-watt, 21 750-watt. Total wattage is 27,750. Equipment is aluminum high bay and was installed by California Electric Co. of Oakland

IN THE WEST

As elegant as the most exclusive night club yet popular priced for the common people and big enough to hold a thousand couples is the swank Palladium—dining and dancing palace in Hollywood for which Lee Ellingwood was engineer, Oscar W. Meissner illuminating engineer, Commercial Electric Co. contractor. It is probably the largest totally indirectly lighted hall anywhere. Main auditorium is lighted by three circular coves containing a row of fluorescent lamps and a lamp strip of incandescents in three colors. The coves are outlined with ornamented and etched curved Lucite sections edge lighted by concealed white lamps. Under the balconies coves radiate from the center toward pillar supports. Large circular coves light the rear areas of the balconies. Lighting load totals 190 kw.; lamps total over 3,800. Circuited for color control, effects are changed over the dance floor from a control balcony. The stage is flanked by two illuminated plastic circular towers housing radio control rooms and sound equipment

☆

Palm Room, Motel Inn, in Bakersfield, Calif., is shown in the middle picture. It was engineered by John Walsh of PG and E. Features of the job are: coffers, white plaster, six large and four small; anemostat ventilator (center); lighting concealed inside of cove near center; bare lamps, 3-circuits with color control, and when all on white giving 30 ft. candles; contactor controlled from orchestra niche; trick table lighting from under flowers in lounge. Bowers Electric Co. handled this exceptional job



Newly-lighted Fresno, Calif., ball park won plaudits of ball fans and lighting experts alike, shown below. The park is illuminated with 138 G-E sports floodlights, and when fully lighted, represents an electrical load of 242 kw. Adjacent to the park is the athletic field for football and track which is similarly equipped. Photo snapshot made from the lighting of the field alone

Lighting Campaigns this Fall

What Some Utilities Plan in Promotion

We are now developing a complete and quite aggressive promotional program on lighting for this fall and winter. In the domestic field objectives are to stimulate much greater distribution of light conditioning equipment through dealers, taking advantage of the increasing purchasing power and the greater relative availability of this type of equipment.

To accomplish this, Puget Power's program which will be known as "Light Conditioning for Defense," will include: (1) Increased light conditioning newspaper advertising. (2) An extensive distribution through electrical dealers of light conditioning promotional pieces. (3) A series of educational clinics for electrical dealers, their sales employees and Puget Power's public contact employees covering sales features of light conditioning equipment. (4) Furnishing light conditioning display service for all approved light conditioning dealers, and (5) Lectures and demonstrations before service clubs, women's clubs, P.T.A.'s, etc.

In the commercial and industrial field our efforts will be concentrated on raising the standards of lighting installations for offices, stores and factories and on the improved use of high quality, high level fluorescent lighting. This objective will be supported by an extensive, illustrated group demonstration program of an educational nature to commercial and industrial customer groups, dealer contractors, employees and others. There will be an ample distribution of direct mail and promotion literature. The special program of assistance and cooperation with architects has been developed. Particular emphasis has been placed on the development of lighting installations of 50 ft. candles or better as example and proof leadership of a higher level of lighting and improved standard of fluorescent installations.

—C. T. Bakeman

San Diego G & E

We find the druggists to be the most progressive of merchants. By presenting our story to them properly, the majority have put in what amounts to signboard lighting on their exterior walls. They all attest to the fact that they have shown improved business because of this. It is a very desirable load because of long hours of burning.

We have no special plans for lighting promotion other than those which we have been following. First of all, we send out direct mail literature, which usually carries pictures of local installations. We run ads once a month in the local newspapers covering "Better light—better sight" and I.E.S. lamps. This, of course, is directed to residential customers.

We are also putting out institutional ads addressed to the commercial lighting customers.

—A. I. Benedict,

Pacific Gas & Electric

We are planning to stress lighting quite emphatically during the next 90 days in hopes of stimulating sales through all channels. There are now approximately 50 light conditioning centers for the display of lamp bulbs and adapter fixtures in the territory and it is our plan to secure placards, banners, etc., which will be supplied to all dealers in an attempt to focus attention on lighting in each dealer's store. Our regular newspaper and radio advertising program will feature the application of lighting, especially in connection with the national defense program and our entire sales staff will devote their efforts to lighting promotion.

—D. B. Leonard,

Wash. Water Power

Our sales plan for this fall and winter contemplates swinging all of our emphasis to light conditioning in residential and commercial classifications. Detailed information on residential sales is now in preparation by Frank Tool, manager of residential sales. While our commercial sales program is essentially all-service throughout the year, we are shifting the emphasis to light conditioning beginning the first of September. This will be accomplished by setting up quotas for salesmen's activities aimed to produce lighting sales and through direct mail advertising, but without any changes made in the credit a salesman receives for additional load. In other words, his sales accomplishment in added EAR will apply to all classes of business.

—Ladner V. Ross,

Coast Counties G. & E.

While it is working up on a much larger program, Pacific Gas and Electric Co. during the past few months has been conducting a contest among its commercial and industrial salesmen to stimulate fluorescent installations of 50-foot candles or higher in every community. Filament and other lamp sources are also qualified. It runs from May 2 to Dec. 25.

Although no quotas are established, credit points are necessary to win the major prizes. One point is credited for each sq. ft. of floor area in a qualifying installation illuminated to an average maintained intensity of 50-fc. To qualify, installations meet certain requirements as to floor area and shielding of sources.

Prizes are eminently desirable; first pays expenses for a trip to attend the advanced commercial lighting course at Nela Park, Cleveland, next April. Second prize pays expenses for attending the next Pacific Coast regional conference at Seattle, and third pays for attending the convention of PCEA at Del Monte next year.

PG and E also plans to exhibit at all of the major conventions held within its territory during the next year. First will be an exhibit at the grocers' convention at Del Monte in September. Chad Hulbert, display manager, has devised a spectacular display and one which will be adaptable to show the effects of various light sources upon the particular kinds of merchandise connected with the convention.

Pacific Power & Light

Borrow the customer's home, convert it into a Better Light-Better Sight classroom and wheel the supplies and equipment up to the front door of the home in a trailer. These and other features are embodied in a result-slanted technique developed by Coast Counties Gas

Light conditioning trailer

and Electric Co. for its sales-educational, light-conditioning program, which got into full swing this year in Santa Cruz, Calif.

A volume of immediate sales is evidence that customers like it. Under the direction of Sales Manager Harvey Edmund and the supervision of Milo Cain, the project employs two men, versed in both light conditioning and customer good will and specifically trained for the job.

Both men are on straight salary. Sales pressure and technical jargon are taboo. Their job is to teach light conditioning in terms of the customer's own home, employing methods the customer can understand.

Following the company's meter routes, the men work with a trailer which carries a full quota of I.E.S. units and all equipment necessary to light condition any home. Every home on the route receives a call. Demonstrations require from fifteen minutes to an hour, depending on conditions.

Simple demonstrations with the light meter are employed, lighting units are left on trial, low terms are stressed and a special gift globe is presented in cases where it seems desirable. Reading lamps and kitchen units have been found to be the successful starting points for large numbers of the demonstrations.

The men wear natty whipcord uniforms and are thus identified as legitimate company service employees. Planned as a year 'round educational program, the campaign has produced an unanticipated volume of daily sales revenue.

So. Calif. Edison

"Selling Begins at 50" is the slogan of a commercial and industrial lighting sales campaign now in progress in Southern California Edison Co. service territory. Making a concentrated bid for big business at a time of year when lighting sales usually are slow, Edison's 22 lighting engineers are energetically impressing customers with the higher intensities needed for today's business tempo.

Opening gun of the campaign was the first of a series of direct mail advertising folders presenting outstanding 50 ft.-candle installations and enclosing a return postcard for a free lighting check-up. The advertising, prepared under the direction of R. G. Kenyon, advertising manager, is being sent to a picked list of commercial and industrial lighting customers.

A contest with cash prizes is sharpening interest in the campaign on the part of the lighting sales staff. A $5.00 bonus is paid to each man selling a 50 ft.-candle job from June 23 to Nov. 30, meeting the following standards:

1. The 50 ft.-candle intensity must be maintained.
2. At least 200 sq. ft. of office space, 500 sq. ft. of commercial space, or 2,000 sq. ft. of industrial space must be included.
3. The lighting must be of the proper quality for the tasks performed in the area.

Several grand prizes will be awarded at the close of the campaign in a manner that equalizes the opportunities for men working in busy, densely populated areas and men in rural areas where activity is not so pronounced, according to R. C. McFadden, Edison Co. sales manager. The campaign is under the direct supervision of G. M. Rankin, director of lighting.

All men selling 50 ft.-candle jobs become eligible for membership in G-E's "Forty-Niner Club."

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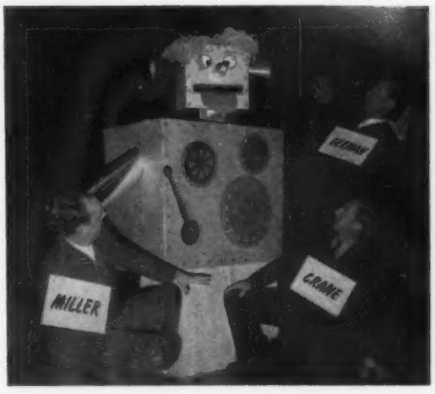


A skit presented before Edison Co. lighting sales meeting depicted this animated "Man From Mars" appearing out of the darkness to frighten Dave Miller, Harold Crane and W. T. German of the lighting sales staff, impersonated by actors L .W. Crosby, C. V. Ridges and W. B. Cheney.

Average OPERATING COST CHART

of representative Los Angeles office buildings

The following figures were obtained from *confidential* information given to the Bureau of Power and Light during a recent Lighting Cost Survey of representative office buildings. Compare these interesting *average* cost figures with your own:

	COST PER SQUARE FOOT PER MONTH		
	HIGH	LOW	AVERAGE
JANITOR SERVICE: Covers labor and all cleaning materials; soap, towels and floor waxing but *not* window cleaning.	3½¢	2¢	2½¢
ELEVATOR OPERATION: Covers maintenance of elevators, operators' salaries and power.	2¢	1¢	1½¢
VENETIAN BLINDS: Covers cleaning and repainting when necessary; overhaul of tapes and cords every 3 to 5 years.	1/5¢	1/13¢	1/8¢
WINDOW CLEANING: Usually a competitive contract job. However, generai average is as shown.	—	—	1/12¢
TAXES: All property taxes levied by State, Federal or Municipal Government paid by building.	4¢	2½¢	3½¢
INSURANCE: Covers all following forms of insurance; fire, public liability, earthquake, theft, workmen's compensation.	1/3¢	1/4¢	2/5¢
PLUMBING: Covers normal maintenance, labor materials but not major plumbing alterations.	1/12¢	1/16¢	1/14¢
MODERNIZED ILLUMINATION: Covers capital investment to modernize lighting system (switchboard overhaul, increase in riser capacity, increase in branch circuits on floors, additional outlets, repainting all ceilings, new lighting fixtures,) and includes additional electric energy and lamp cost.	1/2¢	1/4¢	3/8¢

Figures such as these, expressed in the building manager's own kind of cost figures, have proved effective in Los Angeles Bureau of Power & Light promotion of the relighting and wiring of downtown office and loft buildings. Similar figures could be compiled in any city to obtain results of a similar kind among office buildings

17,000 readings have been made by the "traffic flow meter" shown above. Traffic flow meter stationed at test point evaluates passing light and existing street light

STREET LIGHTING EVALUATOR

Rocky Mountain Electric League promotes mercury vapor street lighting by means of G-E evaluator, donating tabulations to city officials

ONE-THIRD of all the mercury vapor street lighting in the United States is concentrated in the city and county of Denver, as a result of *blitz* promotional development in recent months by the Rocky Mountain Electrical League. In Wyoming, New Mexico and Colorado outside of the metropolitan region, Dana W. Rowten and Murray Graff, co-chairmen of RMEL'S street and highway lighting commitee, have carried the torch of "safety with light" with their General Electric street lighting evaluator, leaving a trail of brilliance in their wake.

Some 17,000 readings on the evaluator, which they call a "traffic flow meter," have gone into the record and been presented to municipal authorities, electrical inspectors, mayors, highway officials, police, councilmen and others.

Ten thousand of the readings were made in Denver alone, on 50 miles of streets; 7,000 readings covered Casper and Cheyenne, Wyoming; Grand Junction, Colorado Springs, Pueblo, Estes Park, Leadville, Boulder and Alamosa, Colorado; Albuquerque and Raton, New Mexico. A climax of the program, to date, was observed June 14 at Raton when that community celebrated completion of the best lighted highway in America, a traffic artery illuminated by 24,000 lumens per standard, each mounted at a height of 25 ft., with 60-ft. spacings. The Raton installation, incidentally, marks the pathway trod by pioneers of the historic Santa Fe Trail; was engineered by the RMEL street and highway lighting committee, and is serviced by the Raton Public Service Co., a municipally owned system.

Especially interesting to the communities on which Rowten, Graff, and L. A. Goalby, W. A. Reef, A. J. Walter, Harold L. Vaughn, George E. Lewis and Melvin O. Lindquist have trained their sales guns is the persuasive economic fact: Modern street lighting is installed at approximately 75% of the old equipment's cost, provides four times the amount of illumination, and consumes less current than was previously used.

Procedure to prove the thesis: "More light, more safety, more business, more beauty, less expense" starts from the pavement up. The traffic flow meter is stationed at a test point and measures the amount of light, number of automobiles passing; evaluates these factors in their relationship to existing light conditions. If one thousand cars pass the test point during the observation period and there is light to service safely only half that number, the evaluator makes a note of this circumstance. Pedestrian traffic is another vital factor. Type of paving, if any, glare, obstacles and other considerations enter into the complete record. Based on this research, charts are prepared, estimates for changes and improvements made and, finally, recommendations submitted to the potential customer.

This traffic flow meter is something new. RMEL procured the first such machine turned out by General Electric Co., and the committee on street and highway lighting studied its operation under the direction of G. B. Buck, Jr. G-E research engineer who was largely responsible for the machine's creation.

The exhaustive survey of Denver's street lighting system was finished July 1, and work on estimates for 100% safety with light are in process—simultaneous with the installation of 20 mercury units, each of 16,000 lumens, on one of the city's most heavily traveled thoroughfares.

Over a year ago the Committee started its intensive drive equipped with the knowledge that lighting in Rocky Mountain territory provides dependable load at all seasons. During depression, it is the last to show a decline, and it is first to surge upward when economic conditions improve. Lighting, furthermore, is contagious on a broad front. Merchants on dark sreets are not inspired to light up their windows for night display, but promptly on the heels of new illuminating standards in their neighborhood brighten the exterior of their places of business with electric signs, and bring their windows into lighting harmony with the street. This improvement steps up their turnover and profits causing them to boost for safety lighting in the community whenever such support is needed.

A convincing, and rather typical demonstration was provided by the trial installation at Fort Collins, Colo. Every violent death in that county during 1939 occurred at an intersection on the main state highway where two bridges are a short distance apart. Here adequate lighting units were placed, through cooperation of the league's committee with a manufacturer of highway lighting equipment, members of the state chamber of commerce, a lighting engineer and others. The project was carried out with the assistance of the Colorado Secretary of State and the state safety council, the Public Service Company of Colo. providing the necessary current. Not one death occurred, not even an accident at the bridges for 12 months. When the League announced, with due publicity, that the test lighting would be removed, Fort Collins city officials, property owners, business men and motorists generally petitioned to have it retained permanently. It is still there and has served as sales argument for similar installations in two nearby towns.

The R. M. E. L. traffic meter, employed by the street and highway lighting committee, will be drawn into service to help cut down the Denver automobile-pedestrian death toll which, up to July 20, totaled 33 since Jan. 1, 1941.

A citizens' traffic safety committee, chairmanned by Walter H. Marrow, a business executive, has undertaken to do what the police force acknowledged itself unable to accomplish, stop traffic fatalities. Marrow named George E. Lewis, RMEL manager, chairman of the pedestrian safety division, charging him with responsibility of determining what tricky factors of light, glare, color or carelessness contribute to hazzards.

The traffic meter, or evaluator, is, therefore, being groomed to record automatically density of foot traffic at street intersections after dark, with special attention to lighting conditions. Previously geared to evaluate vehicular traffic in its relationship to adequate illumination, it will prove equally valuable at its new assignment.

SAFE TROLLEY

Exposed trolley wires on outdoor or indoor craneways eliminated by new trolley duct development

Exposed trolley wires feeding outdoor or indoor craneways have caused the safety engineers much concern and have been the cause of numerous accidents which disrupt the morale of employees and proved costly to management. To meet this problem in the shipyards where defense industry calls for speeded up production, Kuchel & Sievers, electrical contractors have been installing a new development of Trumbull Electric Mfg. Co. designed by Charles Barkus, Trumbull engineer in San Francisco.

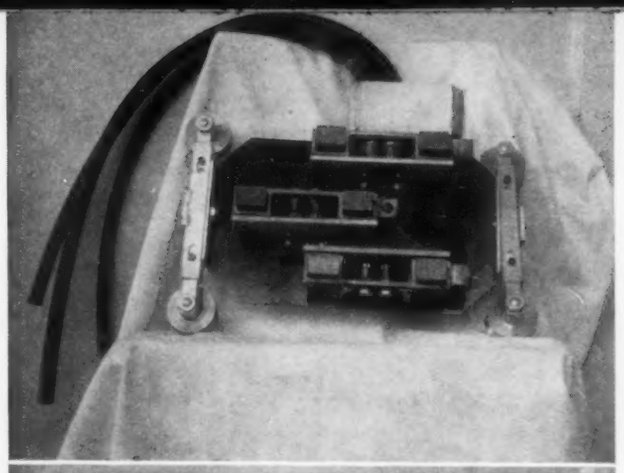
Experiments with this type of trolley closure began some two years ago and an installation of the first experimental model has been in operation in a large industrial plant in the Oakland area for approximately that length of time. However, for outdoor use under drastic weather conditions, a number of mechanical and electrical problems had to be worked out with greater refinement by Barkus.

A trolley duct has been made by this manufactunrer for use with portable tools in a shop. Its rated capacity is 30 amp. with rolling contact and 50 amp. with sliding shoes. The copper bus bars in the duct were of 100 amp. capacity for 575 volts maximum. Usually it is operated at 230 or 440 volts, 2- or 3-wire, and at various frequencies, to supply electricity for portable tools used in an assembly line. It comes with collectors, plug box, fuse protection and motor protection, etc., and is now familiar to industry.

Need, however, for safety protection of crane trolleys along the same principles first came with a requirement that such a craneway trolley should carry 200 amp. at 440 volt, 3-phase. Larger sizes are now being developed for up to 400 amp. and over. Some 4,000 ft. of the "trolley closur" have been installed in San Francisco shipyards.

The trolley closur is made in 10-ft. sections of 10-gage steel shaped rectangularly with an open side. This channel is set vertically against the columns and has a cover over the open side to protect the buses from the weather. Copper buses have sufficient size to allow a liberal factor of safety, are fashioned in such a way that the joints at the sections, being offset, provide a continuous path for the double brushes. The double brushes sliding along the brush insure contact. At least one brush is always in good contact on the bar. Brushes are held in special spring clamps on an assembly which runs on tapered and undercut wheels, with oilless bearings, that run along two angle rails welded to the edges of the housing. Spring tension on the upper wheels takes up the inequalities in the rail while the weight is carried on the lower wheels. Adjustment nuts are provided so that once the brush holder trolley is set in place, it cannot jump out.

Leads from the copper-graphite multiple brushes, which are shielded from each other by barriers of insulating material, are brought through flexible connections to heavy rubber covered conductor leads. These leads loop down below the trolley and are served to the crane motor through customary circuit protection and switching. Provision is made to clamp on to this trolley collector rig so that it will follow the crane along as required. Runs as long as 600 ft. and over seem to operate with perfect conductivity and mechanical smoothness.



Multiple brushes, two for each phase, are held in this assembly. The copper-graphite brushes are carefully shielded by insulating barriers. Leads are brought out through flexible connections to heavy rubber-covered conductors

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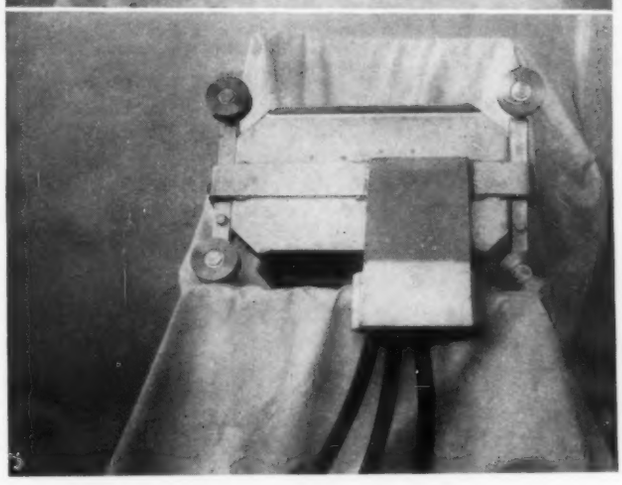
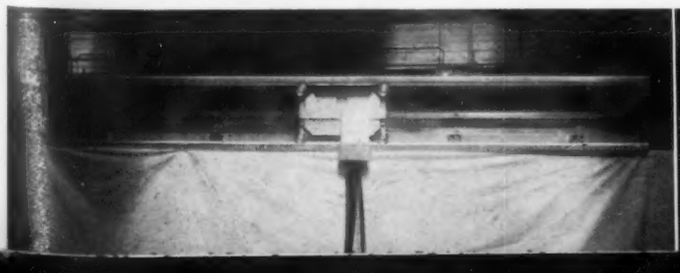


Tapered and undercut wheels with oilless bearings support and guide the brush assembly. The upper wheels have spring tension to take up inequalities in the angle rail. Lower wheels carry the weight. Adjustment nuts prevent the assembly from jumping the track once it has been set in place



"Trolley Closur" installed in San Francisco shipyards is made in 10-ft. sections. Below at the left is a view showing the three buses and the sliding brush assembly. With cover installed as pictured at right, system is safe and weatherproof

● SEVERAL CHANGES have been made recently in the Southern California Edison Co. lighting engineering staff. W. T. German has been transferred from Whittier to Long Beach, where he is engaged in industrial and protective lighting promotion. R. J. Allen of Compton succeeds him at Whittier. Don Grandey is now in Vernon, having been transferred from Inglewood. His place at Inglewood has been taken by Paul DeWay, formerly of Lancaster. E. F. Kennedy, formerly of the Commercial Reflector Co., Los Angeles, is now Edison lighting engineer at Pasadena, replacing R. E. Dahlin, captain in the engineer corps, United States Army, who is now on active duty.

EMEA *Dope Sheet* — *Edited by Howard C. Park*
EMEA of So. Calif.

Lost Terminal Markings

Standard N E M A Three-phase Star Connected Motors—How to Find Them

Should the terminal markings of a double-voltage induction motor become destroyed or lost, some accurate but simple method is needed to determine markings for the terminals, one that will permit the proper connecting of the motor to function on the voltages on which it was intended to be used.

If the following procedure is pursued and the leads tagged, as indicated, the motor terminal will be correctly marked in conformity with the American Standards Association and NEMA standards.

Three-Phase Star Connection

Three-phase Star connected double-voltage induction motors have nine leads of four separate circuits, as shown in Fig. No. 1. Three circuits have two leads each as indicated by T1-T4, T2-T5 and T3-T6. One circuit has three leads T7-T8-T9.

Standard NEMA and ASA Star

For 220 v. star connections are T4-T5-T 6 connected together and T1- T7, T2-T8 and T3-T9 are respectively connected together forming the line leads.

For 440v Star connections are T4-T7, T5-T8, and T6-T9 are respectively connected together. T1, T2, and T3 are used as line leads.

Test to Re-Tag Motor Leads

It will be assumed that the terminal markings of a 3-phase 220/440v., induction motor have been lost or destroyed.

Lamp or Buzzer Test

The three leads of the common-circuit forming the internal-star may be determined by connecting one side of a 110 v. circuit to succeeding leads, until two other leads are located which will each light a lamp connected in series with the other side of the 110 v. circuit. In a like manner the three common leads may be located. However, a buzzer or other instruments may be used instead of a lamp. The three leads so located should be permanently tagged T7, T8, and T9. The sequence in which they are marked is immaterial.

The other three circuits may be determined simply by locating any two leads which will indicate a circuit. Each pair so located are the terminals of a winding and should be temporarily marked: T1-T4, T2-T5, or T3-T6 respectively.

Voltage Test

If the motor under test is too large to be started directly on the line a compensator or some other device should be used to reduce the starting voltage.

The motor may be connected to a 220-v. source of power, connecting leads tagged T7, T8, and T9 *only* to line. The remaining leads should be left disconnected. The motor should be started and brought up to line voltage according to normal procedure of the starting device used. The motor should be run no-load.

Voltage across the open circuits T1-T4, T2-T5, and T3-T6 should be measured. This voltage should be slightly under 127 v. and should be the same on each of the three circuits.

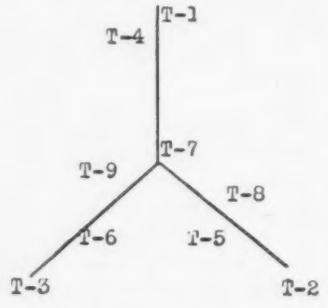


FIG. I

With the motor still running, connect T4 to T7 and measure the voltage across leads T1 and T8, also across T1 and T9. Both voltages should be of the same value and equal.

If the voltages are about 335v. the leads tagged T1 and T4 should be marked permanently.

If the voltages are about 127-v., interchange connections T1 and T4 and change T1 and T4 tags accordingly. Recheck voltage. If new readings approximate 335 v., mark leads T1 and T4 permanently.

Should the voltages, as measured across T1 to T8 or T1 to T9, be unequal, disconnect T4 and T7. Try connecting lead T4 to either of the other leads T8 or T9, until an equal voltage reading is obtained between T1 and the two remaining leads of the internal-star connection.

If the voltages are about 335v., the leads of the circuits tested may be marked permanently, in accordance to Fig. No. 1.

If the voltages are about 127v., interchange leads marked T1 and T4 and change T1 and T4 tags accordingly. Recheck voltage. If new readings approximate 335v., the circuits tested may be marked permanently, in accordance to Fig. 1.

The same procedure should be followed with circuits T2-T5 and T3-T6.

When the leads have all been permanently marked, with motor running and T7, T8, and T9 still as terminal leads, connect T4, T5, and T6 together and take voltage readings between T1, T2, and T3. The voltage should indicate approximately 220v.

Rechecking Test

For a further check the motor should be shut down and reconnected, using leads T1, T2, and T3 for line leads with T4, T5, and T6 connected together and T7, T8, and T9 disconnected.

Care should be taken to connect the line that was on T7 to T1. The one that was on T8 to T2, and the one that was on T9 to T3. The direction of rotation should be the same as with the previous connection.

The motor is now ready to operate on 220v. by connecting T4, T5, and T6 together, and using T1-T7 as one lead, T2-T8 as another and T3-T9 as the third.

[(Next month the procedure to locate lost terminals on three-phase delta connected motors will be explained)]

● Reducing Stock Sizes of Copper Conductors to 17, from No. 14 (American wire gage) to 500,000 circ. mil. and recommending that sizes larger than the latter be not carried in stock but available on order, a simplified practice recommendation for copper conductors resulted from a meeting with the U. S. Department of Commerce, National Bureau of Standards at Washington, D. C., at which all branches of the electrical industry involved in wire manufacture and distribution were represented. The meeting was called at the request of the National Electrical Contractors Assn. Its purpose was to reduce unnecessary inventories of copper wire in view of the enormously increased demand for copper in the national defense effort. Manufacturers are asked to give voluntary cooperation.

Compensating Salesmen Who Sell Indirectly

When Washington Water Power Changed Its Sales Emphasis

REDESIGNING the residential salesman's compensation plan to meet new policies in selling has been necessary in the Washington Water Power Co. territory. The plan emphasizes what heretofore has been considered intangibles, and already a definite shift is noted as the plan goes into effect as to the educational interests of salesmen and as to accomplishments indicated in periodic reports.

For many years efforts of the WWP sales force has largely been measured in terms of appliance units that went on the line. Campaigns geared to a high tempo paid salaries and extra bonuses to salesmen for items such as ranges, water heaters, lamps, etc., which were merchandised according to seasonal demand. Individual sales efforts on the part of the men determined what amount of compensation each one received. Appraising each man's effort was a comparatively simple matter.

The trend to all-service selling, however, wherein the salesman, like a trained pointer, routed out new sales prospects and left it to the dealer to fire the shot that bagged the game, caused an upset in the utility's compensation program. In the first place, salesmen found themselves much like a mail order clerk who was requested to send some kind of dress to a farmer's wife. He did not know anything about the requirements. And unless the term "all-service selling" was translated into a specific list of appliances, the salesman scratched his head and admitted that the term meant nothing to him.

"I don't know what I'm supposed to do," was the salesman's frequent comment. "They call me a salesman, ask me how many ranges and water heaters I sell each week, and then instruct me to make no effort to follow through and make the sale." Consequently, less and less of his time was spent in the field and more and more time was spent disapproving this new idea of selling that seemed to be without incentives or objectives. Half a hundred aggressive, high-powered men who previously got things sold and boosted customer consumption to what was probably the nation's highest kilowatt-hour use, hit a definite slump. They frankly said they did not know what it was all about.

The new compensation plan, at once discarding the thought of complete direct selling, had elements which were designed to serve as sign posts to the bewildered salesman. General objectives were four in number and included:

1. Complete customer coverage at least twice a year.
2. An institutional story on each call.
3. The actual sale of appliances.
4. Securing prospects to be turned over to dealers.

To start the new, full-time outside salesman, it was agreed that a fixed monthly salary of $120 per month would serve as base pay. To be eligible for the next higher salary bracket, or $135 per month, the salesman must have been in the territory a minimum of six months and he must also have an acceptable performance rating as a sales representative of the company. Field performance, checked for salary adjustments Jan. 1 to July 1, or at the end of every six months' period, was to be graded as follows:

1. Assigned new sales calls completed compared with monthly quota	30 %
2. Actual units of merchandise sold on assigned new sales calls as compared with division average	17.5%
3. Prospects furnished dealer which result in sales as compared with division average	17.5%
4. Sales presentations made in evening hours based on a quota of ten such calls per month	5 %
Total	70 %

While this total obviously reached only 70%, it was thought that the local sales manager or supervisor should hold a balance of power, which is possible with the remaining 30%. The salesperson must have a grading above 85% if he advances to a higher salary bracket. To aid the sales manager and supervisor, such points of evaluation as the following were submitted: effectiveness in making friends for the company; the spirit in which the salesman receives and carries out assignments; effectiveness of the salesman in promoting and maintaining good dealer relations; and general conduct of salesman with respect to interest in sales training, punctuality, personal appearance, resourcefulness, organized planning of work.

A grading of less than 70% requires that the salesman's salary be reduced to the next lower bracket or that he be discharged. If he does not rate higher than 85%, he is not eligible for advancement regardless of length of service. If, however, he does meet the required grading, he is eligible to receive $150 after the first year; $160 per month after one and one-half years; $170 per month after two years; $180 per month after two and one-half years; $190 per month after three years, and a top salary of $200 after three and one-half years.

A grading of 17.5% for actual merchandise sold, usually on the salesman's first call, worked wonders in getting the salesman to produce. It was explained to him that the fundamental objective is to promote use of service, and that some service must be sold on every call. This means that when a salesman is successful in developing a prospective sale, he should try to close the order for merchandise carried by the utility. However, to discourage an endless number of calls on a customer, and if such repeat calls are necessary to close the deal, then the prospect is passed on to dealers. The salesman continues to make a complete coverage of customers in his territory.

Where four months earlier the salesmen in one division produced less than one unit sale for every two men, the new system boosted this to an average of 2.67 unit sales per man in a short time. One week's report in this typical division showed that uncertainty as to objective gave way to industry, with 43.3 assigned calls per man, wherein a complete merchandising and institutional story was told, 2.67 unit sales, 3.2 tips to dealers that resulted in sales. As assurance against haste and carelessness, salesmen are penalized 1% per customer complaint, deducted from his general grading.

● SWITCH—Twenty-eight thousand kits and plan books have been mailed to electrical dealers and utilities announcing the Modern Kitchen Bureau's fall electric range campaign. Backed by an advertising campaign in 5 national magazines, the Bureau's promotion is a direct merchandising drive on the theme "The Switch Is On—Cooking's Going Electric—Change NOW to a Modern Electric Range!" Drawing an analogy with the first general use of electric lights, the advertisements portray the acceptance of electric cooking among modern housewives.

"The Party is Over"

Western Market Buyers Told What to Expect in These Days of National Crisis

IT would be trite to say that it was the biggest market, even though it was. More accurately it was the most realistic market in years, this 52nd western home furnishings market, at the Western Merchandise Mart, San Francisco, Aug. 4-9.

Realism rather than inspiration characterized the two big dinner meetings; the industry conference dinner Tuesday night, the radio and appliance trade dinner Wednesday night. Crowds were there not to be inspired to greater selling achievement as in the past but to learn direct from the sources just what to expect under war conditions in the immediate future. Now riding the crest of a buying boom in a sellers market, dealers who felt a break ahead to be inevitable wanted to keep their heads above water and swim, rather than be pulled down in the undertow.

Buying was brisk. Order placing was definite and immediate; not "I'll give you the order when you come around next time." There was concern over stocks, prices, styles, quality—if substitutes were to be used. Frank K. Runyan, vice president of the Mart said, "While the week broke all records for a Western fall market, it was by no means a run-away market."

What the speakers at the dinners said was significant. Therefore it is reported here rather completely, if tersely. As a guide to future action, the advice handed out by Lorenzo Richards, the dealer, and Dr. Bogardus, the New Dealer, at the first dinner, was right on the bullseye of present conditions.

Lorenzo Richards, president, Boyle Furniture Co., Ogden, Utah, and president National Retail Furniture Assn.

How are we to carry on store management during the emergency? That is our real problem. I'd like to make the following practical suggestions:

1. Keep cool, relax. Don't stampede either in buying or selling.
2. Cooperate with the government.
3. Cooperate with one another.
4. Cooperate with the manufacturers. Together you can solve many of these problems to better advantage.
5. Disregard the idea of 'business as usual.'
6. Prepare to conform to voluntary standardization. This mean fewer patterns and fewer styles.
7. Keep informed. Never has this been so necessary.
8. Buy more carefully. This is even more important in a seller's market than in a buyer's market.
9. Make up your minds major appliances will be difficult to get.
10. Refuse to place orders on a prevailing price basis. I congratulate the manufacturers who have adopted the allotment plan. It protects both the small and large dealer.
11. Don't speculate in inventory. If you make too much money, the government will take it in taxes anyway. The postwar slump will catch you and you'll lose it otherwise. Remember, merchandise is subject to obsolescence because the American public is so style conscious.
12. Base your buying on your *own* territory market, not national figures. Not all areas have defense business.
13. Keep your inventory well-balanced and in the price range of your own people.
14. Look into the field of more juvenile goods.
15. Protest hidden price increases such as elimination of cash discounts. Cash discount is a sound merchandising incentive and should be maintained.
16. Watch your lay-away type of business. You won't be able to take such risks.
17. Watch down payments and contracts. Your credits and collections will be more important. You will need liquid capital in a postwar period. Get better credit terms. Never mind what the competitors offer. Collect harder. People will tend to spend more of their income on amusements and pass you by.
18. Examine your advertising and merchandising. People are busy and read less. Your ads will have to be better designed. Don't use scare ads.
19. Grade up to better merchandise. Step up the sales. Supply real information for the customer.
20. Keep prices in relative range.
21. Say *alternates*, not substitutes.
22. Look into your personnel problem. Readjust salaries.
23. Place patriotism above yourself. If you do this, many of the problems will solve themselves.
24. And finally, be thankful you live in America."

Dr. James F. Bogardus, price executive for home furnishing industry,

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"Like every other retailer, I'd looked forward for a long time to a seller's market, but this one has strings attached to it. The answers we've used in previous years can't be used now. The first problem of every retailer is to orient himself and synchronize with the Federal government in the defense program. The Association has always opposed infringement of personal rights by the Federal government and will continue to do so when this emergency is over. Right now is no time to argue. We will be glad to cooperate with Uncle Sam on any reasonable plan. It doesn't make sense to ask our sons to go with the armed forces and then renig on our own service to the government."—Lorenzo Richards.

BOGARDUS

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RICHARDS

"I believe that American business can meet this challenge. We hope it will meet it voluntarily. Orders will be issued only where necessary. Orders already have been issued to cut production of refrigerators 50% and washing machines 50%. Keep prices down. Keep prices stable. We are not asking anyone to sell below cost. We want you to make a reasonable profit. But we will not permit speculative profits. We will more than meet you halfway and do everything we can to help you in meeting your specific problems. We want to study your costs with you, your overhead and profits."—Dr. J. F. Bogardus.

Office of Price Administration and Civilian Supply, Washington, D. C.

"What we are in is definitely *not* a a business boom. It is a national crisis. And you must guide your policies accordingly. The emergency calls for sacrifices, a great many personal and business sacrifices.

"Wars are fought these days with mechanical equipment. Mechanical equipment takes metals. Businesses not concerned with national defense must adjust themselves to the needs of those who are. Directly affecting your business will be sheet steel. It is most conveniently converted to plate, which is in strong need.

"Industries will need to save metals by simplification of their products and by standardization. They will need to use substitutes.

"Our purpose is to prevent skyrocketing of prices that may result in inflation. As merchants you have an obligation to the public to protect it from excessive prices. See that you do live up to that obligation. Supply will not meet demand. Demand will increase. There will also be increased purchasing power. Combined, these forces lead to inflation. We will not have to go without but we will not have as much as people want.

DOSTAL

"The open price policy is bad. We are asking firms to make stable prices. If they are unable to deliver, we ask them not to take the order. Keep inventories down. It falsely stimulates production to order more than you can immediately sell.

"How are we to control inflation? We advocate a price ceiling. Not fixed prices but a ceiling beyond which prices should not advance without reasonable cause. So far this applies to raw materials only. It would be a very complicated problem to apply to retail prices. In that field we hope we will not have to fix price ceilings, but if it is necessary we will do so.

"Unless new designs are reduced drastically, there will be no new designs. Reduce the number of old lines carried. Cut out the items you have been losing money on.

"Simplify. Gadgets on household appliances in many instances can be eliminated. They all use materials. In the making of a new product, be sure that the consumer gets the better product.

"Don't increase mark-up in areas doing defense work just because you think you can get it.

"Don't expect to base your buying on replacement costs. You can go too far in this.

"Manufacturers and retailers—don't indulge in fright selling. It is contrary to the defense policy.

"Duplicate orders in order to make sure to get what you want will put manufacturers in a bad spot. Don't do it. If duplicating manufacturers base their quotas for raw materials on such false orders, there will be waste.

"Tighten terms right now. Watch your credit and installment selling. There is a group in Washington which favors the total elimination of installment selling. I hope we won't have to come to it. It depends on you.

"Let me stress again that we want to work *with* you on this problem. I can promise you friendly cooperation and we will meet you more than half way. But the problems *have* to be worked out and time *is* short. Mistakes will be made. It is inevitable. But let us make as few as possible by attacking the problem together."

WILSON

"This is a good time for retailers to anticipate future operating conditions by practicing budget building for various levels of business. Whether you need to or not, it is well to go through the motions. It is good practice and it may be very useful. No harm will be done if you do get all the merchandise you want. You may discover some savings and shortcuts that will be profitable to you anyway. If and when you must accept curtailment, you will have your formula all worked out. You will not be rushed or shocked. You will be prepared to make the proper moves. Do this now while you have time."—Fred C. Wilson.

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DORSEY

"The most menacing competition, however, is coming from an unseen direction, one from which gadgets won't help you. It is the outstanding cooking performance of the electrical range which is the real competition. This touches close to a woman's major interest in a range. Cooking use value must be emphasized to maintain a high average price level. The days of deals are just about over."—Paul J. Dorsey.

Trade dinner speakers were gas range man Dorsey, who inadvertently gave electric range cooking the best boost it has had in years when he told how gas ranges now can almost match electric range cooking performance, and radio man Wilson of RCA. Appropriately the entertainment was a radio show, presented by KPO and KGO under the supervision of A. E. Nelson, San Francisco manager of the National Broadcasting Co. Charles Dostal, Pacific Coast district manager of Westinghouse was chairman of the evening and discussed briefly the manufacturer's situation in meeting both defense and civilian needs.

Fred C. Wilson, manager, field sales activities, RCA Manufacturing Co., Camden, N. J.

"Three fundamental objectives should govern retailers these days.

"*First* of these is national defense. If this is not made the first objective, we may have to find a substitute for our way of living and will have no need to worry about the other objectives.

"Manufacturers who tell you that because they are not engaged in defense orders, they can supply you with all the merchandise you want are certainly not acting in the best interests of the nation.

"*Second*, retailers must solve the problem of carrying on their affairs in the emergency.

"Taxes will be higher. They will become a problem with lower sales volume on margins which are already narrow.

"We hear of the use of substitutes. The time has almost come when we are looking for substitute for substitutes. Everyone will feel the shortages later if they do not already do so.

"There are still lots of lines of merchandise that you still can sell in quantities. Look around to see what is available. Don't worry about what you can't sell, look for lines that are available. Phonograph records are a fine example. Nobody anticipates any shortage of these.

"*Third*, dealers need to look toward the future when the props of defense spending are pulled out. That will be a time when there is plenty of manpower, plenty of plant capacity and materials.

"Some of us have had to go through such times before. We have learned from them that it is possible to survive providing you are alert and energetic. You *had* to be good to survive. Windows had to be well-designed to sell. Ads had to pull. Selling technique had to be excellent. There was no margin for mistakes.

"Do some commercial research. By that I do not mean only large organizations. The merchant with one small shop can conduct a study in an orderly way on his own market and methods.

"Try to visualize some of the new technical developments which will help you sell many of the problems of the postwar period. Television is only one.

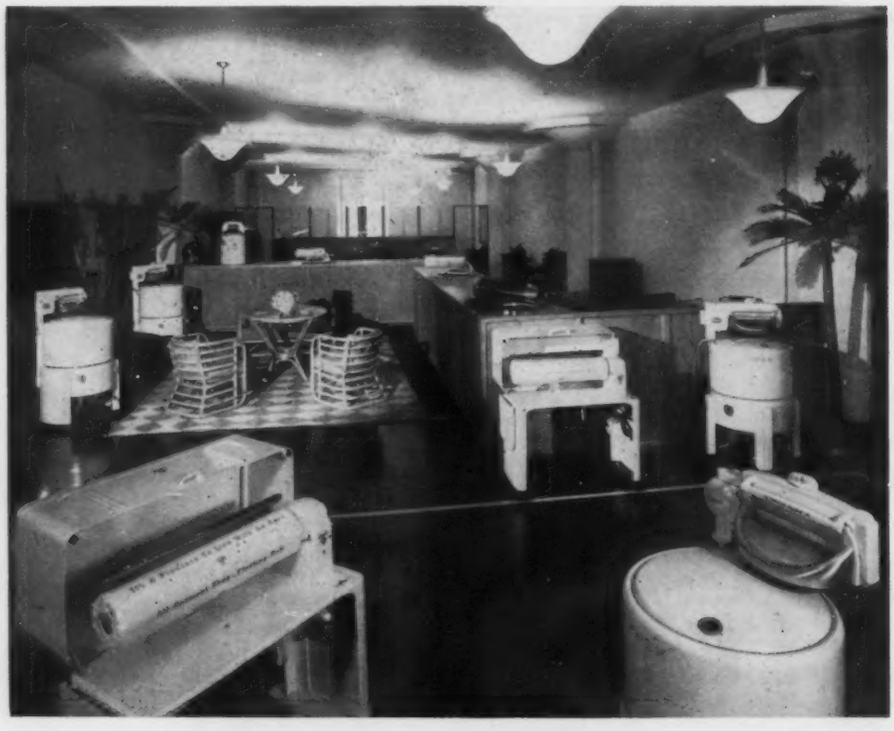
"Design and manufacture are not enough. Application and distribution needs to be studied. The price the public pays for any product between manufacturer and consumer will be much more closely scrutinized in the future."

Paul J. Dorsey, assistant general sales manager, Cribben & Sexton Co., Chicago.

"The present era definitely means a passing out of the 'flash and gadget' stage. Gadgets have enabled gas range people to sustain a high average retail sale. In western markets, it has prevented infiltration of cheap merchandise at cut rates to demoralize the market. However, the gas range industry is now confronted with price competition on this score.

"Range manufacturers, however, have prepared for the situation by improvements in design which permit preservation of the size, shape, taste, and flavor of the food in the better class of ranges."

Modern, effective display representative of the exhibit space in the San Francisco Mart is that pictured below. It is the Western division office and showroom of the Apex-Rotarex Co., located in the appliance section of the Merchandise Mart, San Francisco. E. D. Hotaling, division mgr., is in charge and Wm. Sheehan, district sales manager, also makes his headquarters here



Low Priced Kitchen

A lower-priced all-electric kitchen will be displayed at the various county fairs in the San Joaquin Power Division, Pacific Gas & Electric Co., this year. Already used at the Santa Maria fair, it will be shown at the big Fresno County Fair in early fall. Equipped with lower-priced appliances such as would be appropriate for lower-cost homes, the kitchen has a breakfast counter bar and plush-covered stools adjacent to the cooking area. A laundry equipment arrangement is also shown.

The former electric kitchen used last year will be exhibited at the California State fair in the P. G. & E. exhibit this year.

Electric range business in the San Joaquin Valley since the campaign last spring has continued at a high rate throughout the entire year.

Pocket Calculator

A handy pocket calculator adaptable to local rates and conditions has been prepared by the Frigidaire Division of General Motors for its dealers and salesmen. The calculator is both an electric range cost finder and a water heater calculator. It consists of a celluloid cover and a slide to fit into it. The unit is about 7 in. long and 3½ in. wide.

The range cost finder is operated by drawing the card so that the proper figures appear at cut apertures. It calculates the cost of cooking depending on the number of persons in the family and the local rate. The reverse side lists the basic features of every model range.

The water heater calculator is more comprehensive in that it estimates the approximate number of tubs and shower baths, amount of dish washing, hand washing, shaving and extent of household and infant laundry, and computes the tank size and probable operating costs.

● ELECTRIC COOKING is becoming so popular among the younger generation that a group of boys at the J. J. Brown school in Spokane, Wash., who were interested in cooking, requested an electric cooking demonstration recently from the home service department of the Washington Water Power Co. The boys assisted with the cooking and learned how to cook vegetables, how to mix and bake a cake and how to broil wieners, make chili in the deep well cooker of the electric range. All expressed a desire to try their cooking at home.

PRINT IN BINDING

ELECTRICAL WEST Sales Guide

Let's be Realistic

No use kidding curselves, the "party" may soon be over, the boom of a "seller's market" choked off by a scarcity of product. At the big Western Market conference in San Francisco a government spokesman said in so many words that there **would** be merchandise but **less** of it to sell. The Federal Reserve Board has been told to put brakes on installment terms. Taxes and savings bonds will take the right of way for those extra wage dollars on the loose.

All of which calls for some adjusting to new situations, new problems. Washers and ironers are considered on the first line as consumer necessities after defense needs are met. That gives them a sort of priority of their own that is all to the good for salesmen.

Only thing is that with fewer to sell you'll need to concentrate on the better models to get back profit enough to offset the volume you used to sell at less unit price. Manufacturers are taking that trend. With less materials available they plan to use these precious metals on fewer but better models. In the washer and ironer field that means more emphasis on the automatic, semi-automatic, the spinner drying, the quality line.

To prepare yourself to sell under such conditions will mean some thinking, better organization of your prospect files and your presentation in order to sell up to the stronger prices, the longer down payment and shorter terms. It calls for a review of the fundamentals on the next pages——

HOME LAUNDRIES

SEPT. 1941

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Selling is fun

WHEN YOU KNOW YOUR STUFF!

Back to Benefits--- When Gadgets Go

No doubt about it, gadgets and special features have taken most of the work out of selling. What gadgets couldn't sell, low price would. But times have changed. Even a low total price on short terms will act the same way on some prospects as a high price would because the down payment is large. The buying public has been spoiled with easy credit. When credit isn't easy, that's selling!

You still have two of the best benefits in your favor out here in this territory—**low rates** and **plentiful power.** It is still far cheaper to do such things as home laundering electrically than any other way. These facts should run through your sales story to support the other benefits you will want to use again in selling up to the new terms and merchandise prices. Nothing succeeds like preparation and good old fashioned practice. If you have ridden easily on quick sales lately the idea of boning up on the fundamental sales story may seem tough for awhile—or old fashioned. But in this emergency many conditions will be more like old hard times than modern days.

In the old days when washing machines were few and far between and ironers unknown outside commercial laundries, the fundamental **benefits** of owning and using a washing machine at home sold machines over the obstacles of large down payments and shorter terms as well as higher unit prices and financing costs. This same fundamental benefit story will do it again. There are real human needs involved. The satisfying of these needs justifies a real effort to meet such new financing conditions as will be required of your customers.

Let's take a glance at these old reliable fundamental benefits again—

Here They Are

in case you've forgotten

Washer

Clean clothing, whenever needed or wanted irrespective of deliveries.

Less investment in clothes, since they can be washed oftener if need be.

Children's clothes not outgrown because they are used and worn more while they still fit.

Clothes last longer because of gentler treatment in home washing.

Particular care can be given to special garments like lingerie or colored clothes.

Saving in costs, for despite all claims, home laundering still costs less.

Relief from backbreak over a scrubbing board, for the machine does the heavy work.

Saves time on washdays, and the washing can be done and out of the way early.

Time for other activities, either around home or out-of-doors.

No loss of treasured articles or costly garments, for they never leave home.

Pride in the modern, well equipped home, with labor-saving devices.

Always ready for emergencies, such as caused by lots of company, or illness, or summer play that requires so many changes of cool play clothes.

Weak spots or worn garments can be especially favored and made to last longer.

Overalls and work clothes of husband can always look neat and be clean, making a better impression and giving him a sense of pride in appearance.

Pump Equipped

Saves lifting and carrying of water by emptying the tub quickly, and thus saves more time and energy too.

Spinner Models

Gentler on clothes, easier on buttons and other trimmings.

Blankets and pillows can be washed more easily and dried more quickly. Savings in home laundered blankets.

Utmost in safety and most efficient in the extraction of water from garments. They can be ironed right away if need be.

Tray Washer

Save more space on a crowded laundry porch since tray washer fits right over one laundry tray.

Saves one handling of water. Just turn faucet to fill, pull stopper to drain.

So handy to do just a few things anytime, as it is always set up to do some washing.

A few things every day and there is no accumulation for a big wash day.

Renters find it easier to move with them.

Ironer

Saves money in laundry bills, in clothing investment, in home pressing.

Less wear and tear on clothing, because less straining of clothes.

Presses suits, pleated skirts, shapes sweaters, knitted wear, velvets, etc., in professional way at a saving.

Shrinks yardage before dressmaking and saves here too.

Wet wash or rough dry laundry service can be used and ironing done easily at home at a saving in cost.

Sit comfortably while you iron. (Some women even get expert enough to read while ironing.)

Saves lifting of iron and thus conserves energy.

Saves the feet from long tiresome standing.

You are always presentable and comfortable in case someone drops in unexpectedly while you iron, instead of looking hot and bedraggled.

Keep cool because the heat rises away from the face.

Linens look crisp and glossy.

Curtains hang straighter, are easier to iron because of large surface of shoe.

Less starch needed, prevents easy scorching.

Moth larvae killed by running woolens through heat.

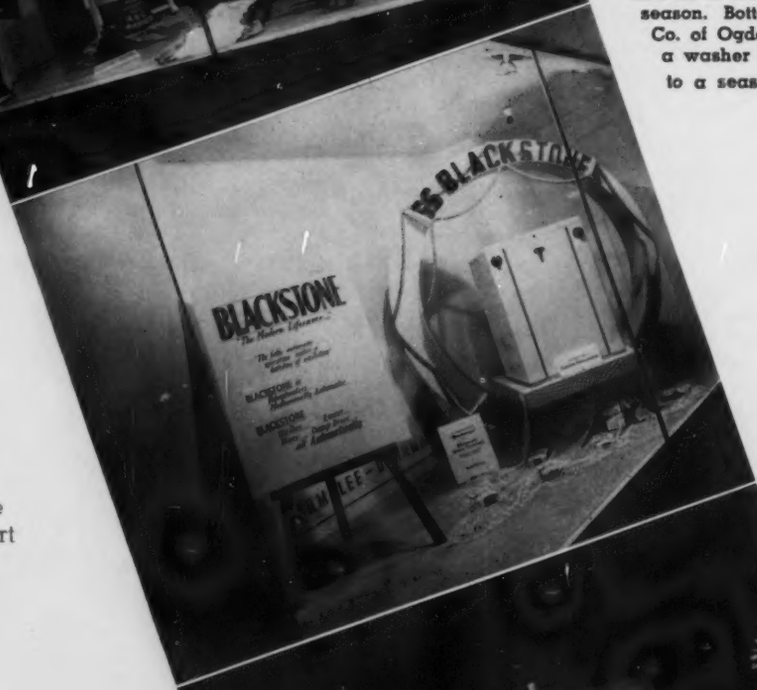
and We'd like You to Succeed at it!

PUGET SOUND POWER & LIGHT CO. • WASHINGTON WATER POWER CO. • PORTLAND GENERAL ELECTRIC CO. CALIFORNIA OREGON POWER CO. • UTAH POWER & LIGHT CO. • IDAHO POWER CO. • THE MONTANA POWER CO. • ROCKY MOUNTAIN ELECTRICAL LEAGUE

"Stuff" to Know

It's a Habit by Now

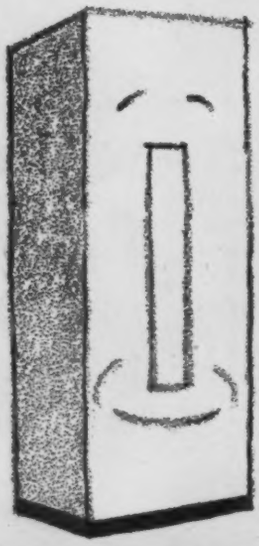
For years early fall has been the season for a drive on washing machines. For the past two years the national association has conducted campaigns, but this year decided to call it off on account of stock. But people still think of it as washer and ironer time. So tune what stock you can get to the season. Display it and advertise the better models. With better purchasing power people will buy better merchandise if they see it and learn what it will do. And it brings **you better commission and profit.**



Always a good thing to do—window display keyed to a theme of the moment. Among last years national winners western dealers did just that. Top, Central Electric Co. of Watsonville, Calif., and (second picture) Austin Appliance Co. of Denver, both used the national defense theme. Parmlee Dohrmann Co. of Los Angeles, next, tied in to summer swimming season. Bottom, Schoss-Read Co. of Ogden, Utah, loaned a washer and was tied in to a seasonal white sale.

Ironer Ideas

Some ideas from stores which sell as many as one ironer to each three or four washers are these: Demonstrate ironers at all times. Send out an ironer with each washer sold to be demonstrated — suggesting it as the companion to the washer. Follow up on purchasers of small ironers to see if it is adequate, trading in at full value if bought within three months. Send a letter to men suggesting an ironer as a Christmas gift. A users club, with a small merchandise reward for real prosprospects. Slip out of the chair when demonstrating, and let the prospect finish the piece. Reassure prospect on her own ability to iron, tell her if she irons a shirt six times she'll be expert and can show others how.



An Ally

to any washer is that source of plenty of good hot water, the automatic electric water heater. When homes are being modernized and a better laundry room installed sell the companion water heater to complete the job. Make it an "ensemble." The water heater will help to guarantee the satisfactory performance of the laundry equipment.

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PG and E Portable Push

Launching for the first time a portable lamp and light conditioning sales program for the dealers of its area, Pacific Gas and Electric Co. has enlisted the aid of the Electric Appliance Society of Northern California. It is completely organized and will be launched for a special campaign period from Sept. 15 to 27.

Three years ago such a campaign was contemplated for the bay area and was organized and ready to go when a strike tied up department stores so it was cancelled. Now because of shortages in other appliance lines, such a program is appropriate and welcomed.

Fall advertising of PG and E on lighting will be adapted to dealer participation. Billboards and bill stickers will be turned to the theme of the need for better light for children returning to school.

Dealer tie-in ads, two in number, will run in 250 newspapers throughout company territory, the first during the week of the 15th, the next the 21st. Display cards for window and store will be distributed to 650 lamp dealers.

Electric Appliance Society will issue a dealer information bulletin with offers of available cuts and mats for local advertising. Clip sheets for newspaper sections will be sent to papers.

In addition, several local units of the Society will hold salesmen's and window contests among all dealers in lamps, bulbs and portable lamps. The San Francisco division, in which Miss Golden Marble is lighting counsellor, will offer $125 in prizes for window displays. Miss Marble will conduct store demonstrations of light conditioning equipment.

Purpose of the campaign, according to O. E. Rush, is to rally the lighting industry into increasing its activities and normal advertising done in the fall so that the combined impetus will make an impression on the public and bring greater results.

● That Electrical Appliances are year around gifts has been proved by many surveys and studies. Weddings, anniversaries, birthdays, Christmas and other miscellaneous events, Mother's Day, Father's Day, and particular celebrations are always the occasion for the giving of electrical appliances. Hence, Landers, Frary and Clark, makers of Universal appliances, are presenting a plan book for dealers based on this idea. Consumer literature, window display material and other promotion helps are keyed to this idea of "glamorous giving."

Electric Restaurant Promotion

Two electric restaurant cooking exhibits were displayed at the Pacific Coast Restaurant Convention and Exposition, held in Seattle, Wash., June 23-25. Sponsors of the displays were Puget Sound Power & Light Co. and the Northwest Electric Light & Power Assn. The association exhibit displayed a large map showing the interconnected power systems of the member companies in the Pacific Northwest, indicating by colored pins the location of the hundreds of completely electrified restaurants and bakeries in the territory, impressing the conventionite with the general acceptance of electricity as a fuel for heavy duty restaurant equipment.

Attendance at the convention exceeded 3,000, and there were 68 exhibitors, several showing electric cooking equipment. Idea behind the utility exhibits was to show the adequacy of electric service; point up the fact that private utility companies had pioneered the modern trend towards electric cooking in restaurants; that this trend was well established with over 1,000 all-electric restaurants and bakeries now in service in the area; and that electric service offered advantages and economy with various stages of complete electrification.

Did You Ever See A Kilowatt Hour?

What started as merely a trick idea to dramatize a sales promotion program turned out to be a museum piece. R. W. Clark, merchandise manager, Puget Sound Power & Light Co., always clever at devising promotion programs and dramatizing them, found some little zipper pulls at the dime store and called them "kilowatt hours." Then by means of helium gas-filled balloons spotted in a similar fashion, these were used to symbolize the growth in kilowatt hours of annual use among customers of the company.

Written up in Electrical Merchandising, Bob Clark received a request from Alfred Ward, curator, of Port Leyden Museum of New York, for these little gadgets and Bob Clark obligingly sent him some "kilowatt hours" with necessary explanation.

Campaigns

Pacific Gas & Electric Co., Sept., domestic lamp campaign.

Bureau of Radio & Electrical Appliances of San Diego County, Sept., laundry equipment campaign. Oct., distribution of radio logs.

Central Arizona Light & Power Co., Sept., lighting campaign. This will also extend into Oct. and feature cooperative dealer activity.

Pacific Power & Light Co., Sept., start of fall lighting program featuring light conditioning for all dealers.

California Electric Power Co., no campaigns scheduled for Sept.

Utah Power & Light Co. & Western Colo. Power Co., Sept., lighting campaign followed in Oct. by a range and water heater drive.

Puget Sound Power & Light Co., Oct., Nov. and Dec., light conditioning campaign entitled "Lighting Conditioning for Defense."

MODERN METERING AIMS AT STANDARDIZATION

Improvements and developments in metering technique assure greater accuracy under varying conditions of load, voltage, temperature, frequency and p.f.

By Fred Garrison
Pacific District Meter Specialist
General Electric Co.

TAKE a look at the annual report of any electric utility company. There will always be found an item of gross income, practically all of which is derived from the sale of electrical energy and measured by watthour meters. In California for instance, approximately two hundred million dollars is measured yearly by the over two million watthour meters in service. With this very large amount of revenue involved it is small wonder that the manufacturers and the utilities have for years cooperated in the development of what is probably the most accurate measuring instrument that is available today—the modern watthour meter.

It is within about the last fifteen years that progress has been the most rapid. Earlier, the meter was largely fitted for the particular job that it was called upon to do and as a consequence, because of the relatively short accuracy range and low current-carrying capacity, it took eight different sizes of meters to measure up to 150-amp. loads. Meters of this older type fall off rapidly in accuracy after the full-load point is passed. As a result of the development of the "long-range" meter some years ago and of later improvements in both heavy-load and light-load characteristics, the modern meter, such as a 15-amp. 240-volt rating, will measure all loads in the range of approximately 10 watts to 14,400 watts.

This development was an important forward step, as it permitted the utility companies to standardize three sizes of meters of the modern type which do a better job than eight sizes did some years ago. As the light-load characteristics of the meters were improved, many utilities standardized the 15-amp. size, both two-wire and three-wire, for their domestic load; and as a result of the increased production of the 15-amp. sizes the manufacturers were able to reduce the prices so that today in both the two-wire and three-wire types the 5-amp. and 15-amp. meters have the same price.

There is, however, no definite standardization of sizes although the trend has been toward the 15-amp. meter particularly in the three-wire type. In California, one utility feels that in order properly to meter the growing load of tomorrow, the 15-amp. meter, both two-wire and three-wire, offers the best solution. Another utility feels that the 5-amp. meter for two-wire service and the 15-amp. for three-wire service offer the best solution. Still another utility, after considerable tests, feels that the 5-amp. modern meter, both two-wire and three-wire, best meets the conditions of its own particular system. The important thing, however, is that a higher degree of standardization has been achieved as far as ratings are concerned and fewer sizes (ampere capacities) are now used than heretofore.

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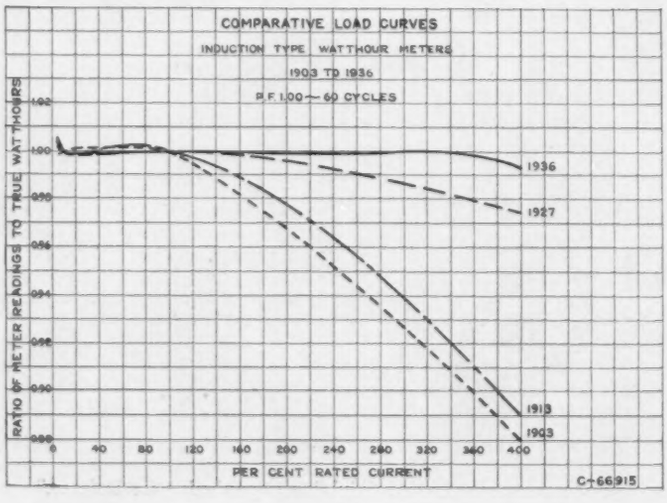
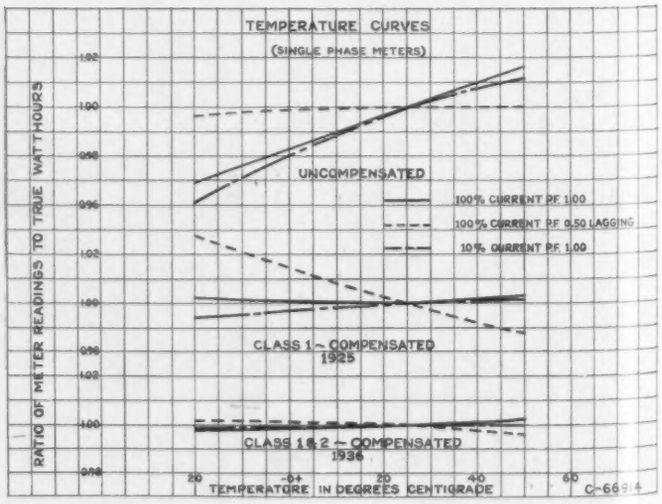
Modern practice in metering calls for new sequence and may involve out-of-door installation of single-phase meters with the attendant extremes of temperature. When temperature compensation was applied to magnets of watthour meters, improved performance at unity power-factor loads resulted. As time went on, loads of lagging power-factor were becoming more general, and temperature compensation was extended to include loads of all values of power-factor normally encountered. As a consequence the modern meter is extremely accurate under all conditions of varying temperatures encountered in service from well below freezing to the relatively high inland temperatures that are experienced.

Other characteristics have been improved to the extent that the watthour meter that we have today is accurate between close limits under varying conditions of load, voltage, temperature, power-factor, and frequency.

The mechanical parts of the watthour meter were also undergoing considerable improvement at the same time the electrical characteristics were being improved. For the past several years the mechanical design of the watthour meter has come in for considerably more discussion that the electrical design and the discussion of any large group of meter

Comparative load curves (left show improvement in registration accuracy. Temperature curves (right) show registration improvement with verying temperatures





men can always be greatly stimulated by introducing the subject of the socket or "S" type versus the bottom-connected or "A" type, and the pivot-type versus the ball-type of lower bearings. The different utilities have largely settled down to more or less definite standards with respect to the "A" and "S" meters. As in the case of the 5- and 15-amp. meters, different utilities have their definite standards. One company may use all "S" type, both single-phase and polyphase; another, all "A" type; and still another will use "S" type for single-phase and "A" for polyphase. All have sound reasons for their choice and in many cases local conditions are largely responsible for the choice of the serving utility.

The two types of lower bearings available also have their strong proponents among the users. A great improvement was made in bearing construction with the introduction of cobalt tungsten for pivots and balls. This alloy is corrosion resistant, and the wear particles are relatively nonabrasive so the hazards from accumulative bearing wear are materially reduced. In the case of pivot-type bearings, a new oil and a new "oil-tight" jewel screw were developed that are expected to last for many years without servicing.

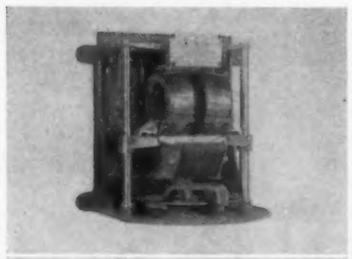
Sapphire jewels have also been under close scrutiny in the laboratory, and it is now the usual practice to supply oriented synthetic-sapphire jewels for the modern watthour-meter bearings. It has been determined that sapphires can be oriented with reference to a vertical or "C" axis of the crystal, and the sapphire jewel cups are cut so that the pressure exerted by the pivot or ball is at right angle to the "C" axis. As a rough analogy this may be likened to a piece of wood with the cup cut to have the pressure from the pivot at right angle to the grain. Although the degree of improvement is not yet fully evaluated, examinations of many bearings that have been in service for many millions of revolutions indicate an advantage from the use of oriented sapphires and the practice has been generally adopted. As a result of these investigations carried on in several laboratories, the modern watthour-meter-bearing system should give a greatly increased life without maintenance.

Damping magnets have also come in for their share of investigation. A special sub-committee of the committee of metering and service methods of the Association of Edison Illuminating Companies was formed several years ago to investigate the effect of lightning discharges on watthour-meter accuracy. Working with the manufacturers over a period of years, various means of decreasing the hazards of this effect were investigated and new materials were considered. One such new magnetic material is alnico, the principal elements of which are aluminum, nickel, cobalt, copper, and iron. This material provided a magnet with as good permanence as the chrome-steel magnet used heretofore. It is practically unaffected by demagnetizing fields from abnormally heavy currents, principally caused by lightning, that are encountered in service. Hazards from demagnetization are also reduced by copper-plating chrome-steel magnets, and this is the practice of one manufacturer. While the Pacific Coast does not experience lightning to any degree comparable with the Southwest and some other parts of the country, this magnet improvement in the modern watthour meter eliminates most of those occasional and mysterious cases of the past where meters were found to be fast without any visible evidence as to the cause.

While the foregoing has been concerned largely with single-phase meters, polyphase watthour meters have also participated in all of these improvements. Because of the load trends over the past several years towards smaller polyphase industrial loads, there has been a demand for a lower-priced meter to measure these loads. This problem was met by the manufacturers in the development of meters of smaller physical dimensions and at a reduced price. The problem was met in three separate ways by the manufacturers. One uses two elements, the disks of which are mounted on a single shaft. Another uses two elements operating on a solid disk, and two manufacturers use a laminated disk with the two elements operating on the one disk. The reduction in size was of particular benefit to the utilities as it permitted the installation of a modern meter in less space than its predecessors required. The reduction in price permitted more economical means of metering low-revenue power loads.

While the modern watthour meter has been improved in many regards and the price is less than it was fifteen years ago, this is in spite of the fact that there are actually a far greater number of varieties and types required today than there were formerly. Reductions in costs are associated with standardization and, generally speaking, the greater number of a given device that is manufactured, the lower the unit cost becomes. Unfortunately during the past several years, the trend has been away from standardization. For example, at the present time manufacturers will supply either type "A" or type "S" meters with either a pivot-type or ball-type of lower bearing.

As another example, several years ago the meter and service committee of the



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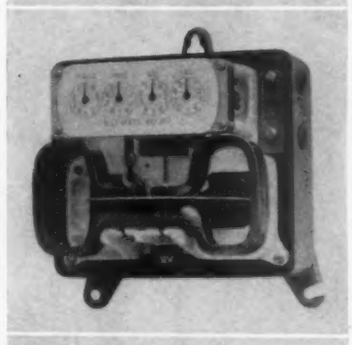

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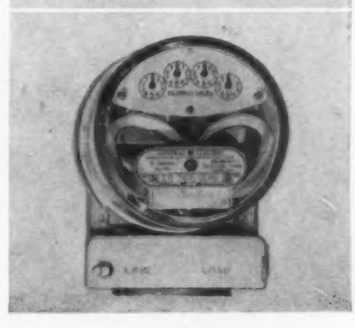

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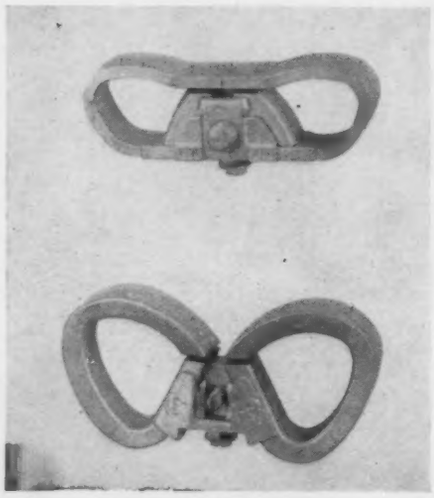


Two types of magnets, "alnico" (above) and chrome steel (below), each have their advantages. "Alnico" especially is unaffected by demagnetizing fields from heavy currents caused by lightning

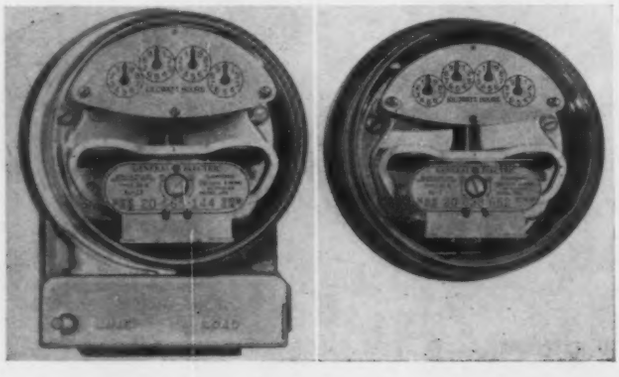
Edison Electric Institute proposed a few changes in the dial constants and register ratios of watthour meters. It was found that if the increased overload capacity of the modern watthour meter is utilized on a steady load, there is a possibility of the register turning over between readings, and as a result, this committee recommended larger multipliers on several sizes of meters. While these new constants have already been accepted, there are several companies which feel that reading errors might result due to the same type, makes, and rating of meter having different multiplying constants. While the new standards will without doubt be universally accepted ultimately, any meters that are not furnished with the recommended register constants must of necessity be classified by the manufacturer as "special."

Special finishes are often required on meter bases because of local conditions. Along the Pacific Coast and specifically in California, there is little or no rain from about May to November, and as the prevailing winds are from the ocean to the shore, salt spray is deposited on meter bases that are in the shore area. This salt and water deposit coupled with the sun makes a highly corrosive condition, and as there is no rain to wash off this salt deposit during the summer months bad corrosion may result. While die castings have considerably improved the resistance to corrosion, in some cases it has been necessary to protect the exposed metal by a protective coating to prevent, or at least delay, the start of corrosion.

Many other special requirements are met by the manufacturer, requirements that are necessary but still result in a special meter. Fortunately, watthour meters are ordered in quantities and when several hundred are manufactured at one time, even though they are special, enough are made in a group to keep the price reasonably close to the low level prevailing today.

The defense program has affected watthour-meter construction to a certain extent. The reduction in the amount of aluminum available for other than defense purposes has resulted in the use of alternative materials. In some cases the meter disk is now made of copper and the shaft of brass; in other cases only the shaft is made of brass. Fortunately, however, it appears as if alternative materials will change the characteristics only slightly. For example, while a change in the rotating element (disk) from aluminum to copper and brass results in a higher weight, there is no particular sacrifice in characteristics, especially when the present ratio of torque to weight is high.

New and varied problems will arise from material shortages, and much time will be required to search for, investigate, and test alternative materials. To a degree this may temporarily retard or change the normal development programs. Yet, with the experience and knowledge gained from these investigations combined with other development work continued progress is certain. Somebody will be sure to build something even better tomorrow. That has always characterized the meter business.



Meter men still argue the relative merits of the "A" type meter (left) and the "S" type (right) and there is no general standardization as to which is to be used for either single or poly-phase loads on any individual utility system. Local conditions dictate the choice.

FIELD TESTING

By L. E. Wiggins

Eastern Oregon Light & Power Co.

A GREATER number of socket type meters are now being accurately and economically tested by a compact, practical truck-tester, originated by Eastern Oregon Light and Power Co. The new testing unit permits the meter tester properly to check the meter *in the driver's compartment*—as compared with the older practice of removal of the meter to the shop for testing, towing a trailer rigged up as a mobile shop, or waiting on favorable weather to open, inspect and adjust the meters.

Electric meter departments have long been faced with the problem of testing socket type meters, which, as a rule, are set in the most desirable locations with respect to existing point of service rather than consideration of later testing accessibility. Usually, meter location is determined by the distribution engineer, who has in mind the most economical point of service for both customer and company. When meters are removed to the shop for testing, the accounting department complains of increased bookkeeping expense; when the meter is tested in the open, the tester cannot work to best advantage in extreme temperatures or in the rain.

With all this in mind, the truck system fills the bill, and should be of interest to others concerned with socket type testing.

In the driving compartment of trucks operated by meter testers, a bracket of channel iron is securely attached to the cowl over the instrument panel and on this bracket is set, either by bolts or screws, a standard Westinghouse meter socket, such as is ordinarily mounted on the house or other building where the meter is installed. This socket can be easily removed from the bracket when not in use. After the socket has been placed in position on the bracket a test jack is inserted, the same as is done when the meter is tested on customer's premises. The truck can be driven to any point reasonably close to an installation of the socket type meter.

In order to make accessible current and potential for testing the meter inside the driver's compartment, use is made of a hose reel mounted inside of the truck just behind the seat on the right side. It is desirable to have a conductor of sufficient capacity to carry a reasonable amount of current without appreciable voltage drop and also one

OF SOCKET TYPE METERS

Portable equipment installed in light truck permits tests being made directly in driver's compartment

that would be mechanically strong. Purchase was made of 175 ft. of No. 12 Tirex, 2-conductor cord, which was found to be of sufficient length to reach any meter desired to test. With the reel mounted as described above, the cord could be pulled out or reeled in with ease. The inside end of the cord was fastened to a terminal block mounted on the side of the reel and to the outer end was attached a socket meter base with the regulation four contacts and equipped with a handle, which made it easy to insert in the installed meter socket, when the meter was removed. As the meter was removed this connection through the cord and meter base maintained service to the customer and at the same time brought voltage into the driver's compartment of the truck.

In making the test this procedure is used: The meter socket is set in position on the cowl bracket and a two-wire jumper connects the top contacts of the socket to the terminals on the reel. The test jack is placed in the socket, then the test meter and phantom load are placed on the seat at the right of the tester and connected to the test jack in the same way as would be necessary if the test were to be made at the house. The driver's compartment can be entirely closed in order to keep out rain, dust, wind or other objectionable elements, such as extremely low temperature, since the compartment can readily be heated by the car heater.

When the proper connections have been made in the truck, the socket end of the cord is picked up by the meter tester, who walks to the meter, unwinding the cord from the reel as he walks. He then removes the meter from the socket and inserts cord assembly. The customer now has service, and potential is to be found in the truck. The tester then carries the meter to the driver's compartment, places it on the test jack, connects the jumper to the terminal on the reel, which energizes the meter and standard. The test and/or adjustment is then made, after which the tester takes the meter again to its original point of installation, removes the cord assembly, plugs in the meter, seals the ring, after which the cord assembly can be taken to another meter and a test completed, or can be taken back to the reel. Several meters of the socket type, or even house type, can be tested in this manner without changing the location of the truck, if it is so desired. Obviously, an increase in the number of meters tested per day is apparent with this system.

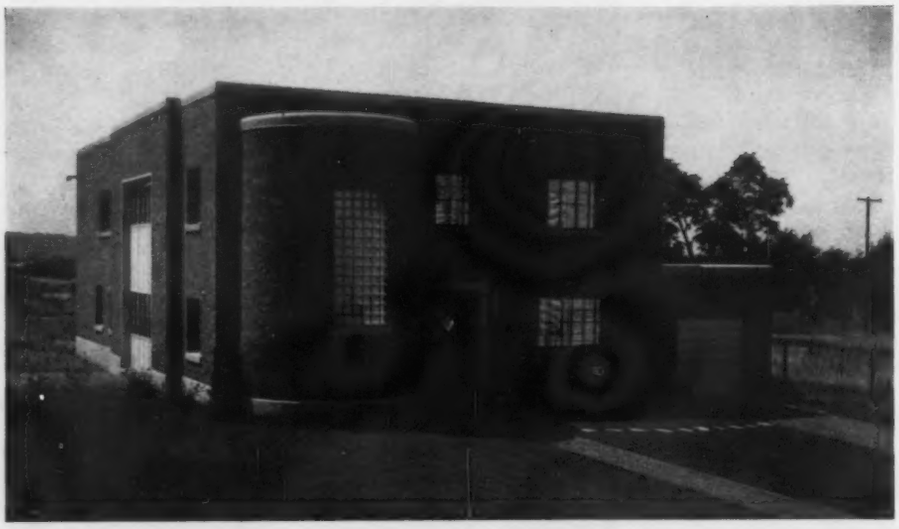
At the end of the testing day, the cord is reeled up, standard and test cords put away, leaving truck free for other usage. This method is convenient for testing meters in out-of-the-way places, especially in the case of pole meters and meters that are located in buildings where boxes and materials are piled in front of the meter installation. Poly-phase and two or three wire single phase meters are tested with equal ease, as no additional connections are necessary.

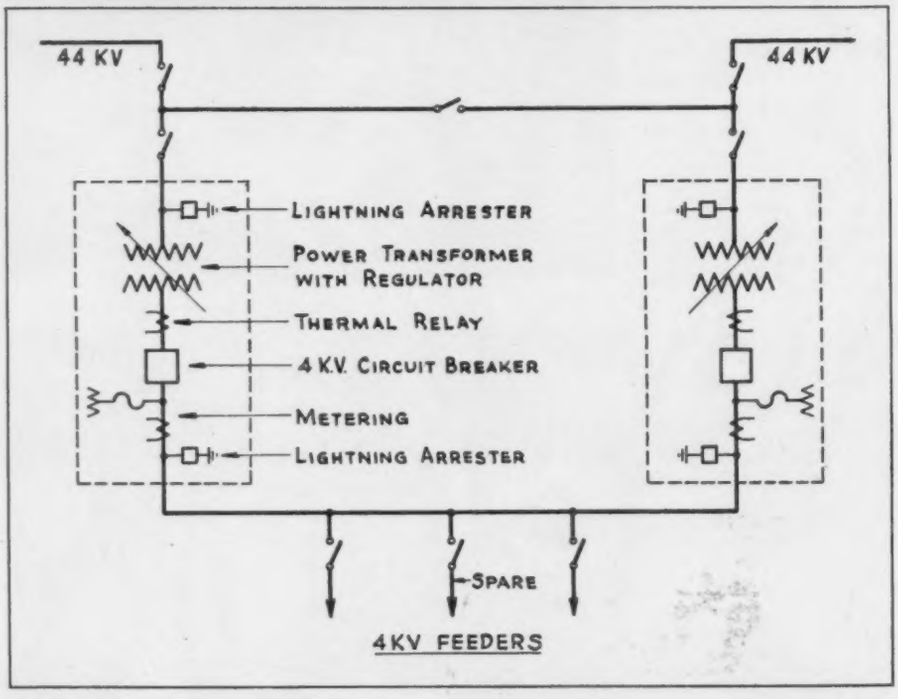
With meter to be tested mounted in a removable socket over the cowl, the tester inserts a jack and proceeds just as though the test were being made on the side of the house

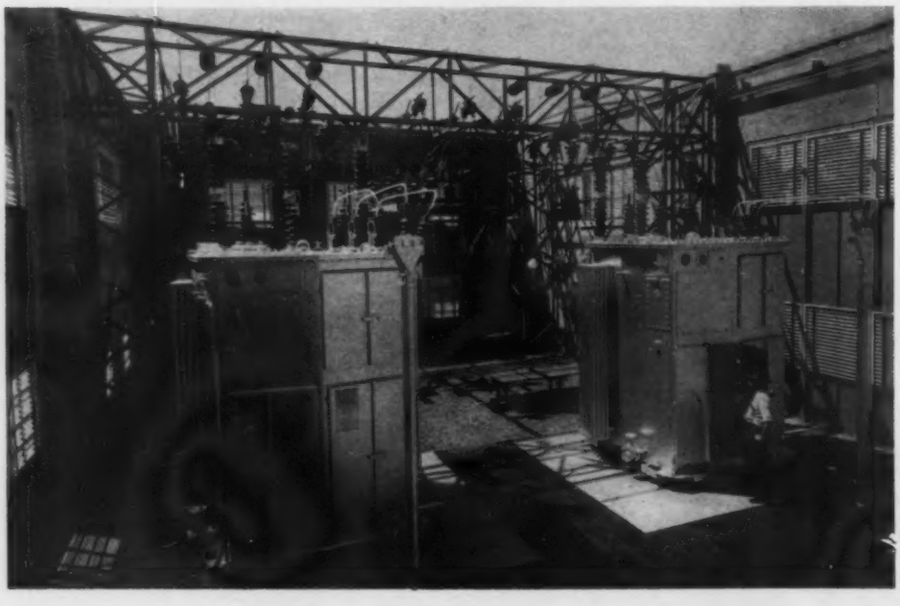
☆

Energy supply for testing is provided through a Tirex cord that is mounted on a hose reel inside the truck. Another socket meter base is used for connecting the cord to the house socket (below)

● IMMEDIATE appropriation of $856,000 for the construction of a 60-mile, 115-kv. line between Colfax and Spokane, Wash., has been requested by Bonneville Administrator Paul J. Raver. The line would close a 455-mile transmission loop now built or building which incorporates six substations. Stated purpose of the line would be to assure power service to scattered defense loads now planned or proposed for the region. The transmission loop of which the line would be a part, would extend from Spokane to Grand Coulee, to Vernita, Wash,. to Walla Walla, to Pendleton, Ore., to Lewiston, Idaho, to Colfax, Wash., and thence to Spokane.







Residential Sub

Unique design worked out that camouflages 44-kv. substation

IN OGDEN, Utah Power & Light Co. has built a substation which might well be marked "electrical engineers, please note." This would be appropriate not only because of the nature of the electrical design, but also because the company has achieved a 44-kv. substation in a residential area while contributing to the architectural harmony of the neighborhood.

The latter was accomplished by surrounding the equipment with a roofless structure which was laid out for economy, protection of the equipment and eye appeal. As is evident in the illustration, the structure is unobtrusively attractive, and it is in a general way representative of the architecture which probably will be typical of the area in which it is situated.

Within the structure is the 44 to 4-kv. transformation equipment. Of interest here are the employment of what might be termed double protection of line and transformer equipment — to achieve service continuity, the absence of high-side breakers—for economy, the selection of completely self protecting 3-phase transformers — both for their reliability and their susceptibility to architectural camouflage, and the clean layout of equipment.

The transformers employed are Westinghouse 2,000-kva., OISC, 3-phase, 60-cycle, type CSP, complete with automatic tap-changing-under-load equipment, metering and inertaire equipment, secondary breakers automatically reclosing, and a tie-in switch for parallel operation. There are two of them.

Each is connected to a separate 44-kv. transmission line, through the disconnecting arrangement shown in the diagram which permits either transformer to carry load from either high-tension line, or both transformers to operate from the same line.

Normal operation finds each transformer carrying 2,000 kw., the station serving a 4,000-kw. load. However, if one line fails, the other line can carry both transformers. Or if one transformer is out of service, the other

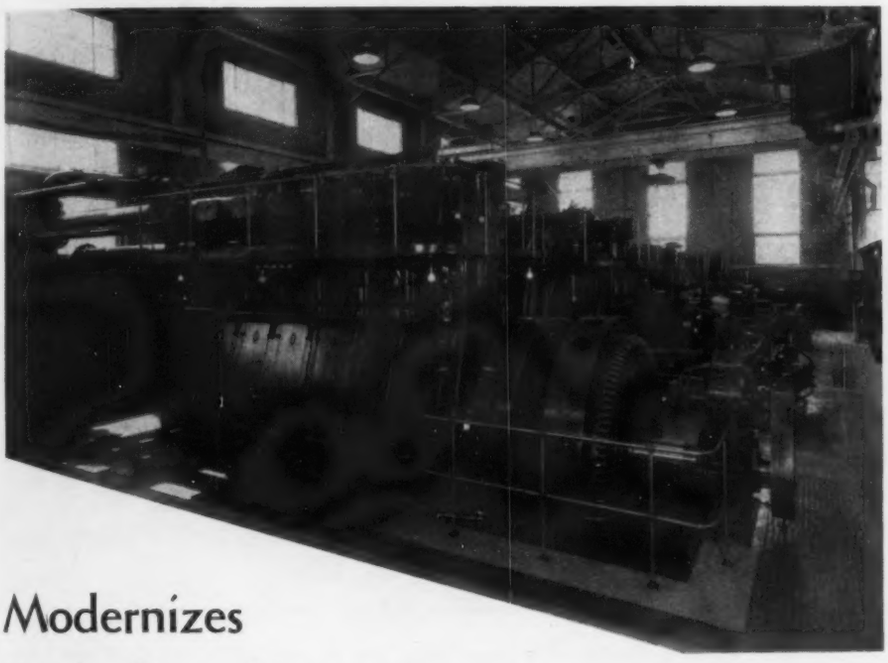
In building Parry Substation, Utah Power & Light engineers achieved the striking structure (top) that houses the 44-kv. equipment shown at bottom. Center is circuit diagram for the CSP transformers

can carry 4,000 kw. for a short time.

In the absence of high-tension breakers, line and transformer are both cleared by opening of the low-tension breaker (installed in the transformer) in the event of failure on the high-tension side. This operation is signalled by an alarm so that a maintenance man can be attracted to the unit immediately for necessary switching and repair.

The tap-changing-under-load equipments (consisting of 16 steps of 1¼%) are arranged for control of both from either transformer. Control is arranged for practically constant secondary voltage regardless of feeder load or load division between the transformers themselves. The substation being situated near the center of the load, voltage regulation throughout the load district approaches zero.

In the beginning, a few "bugs" were experienced, but they proved to be minor in nature and were shortly cleared up. In operation, the station has demonstrated its flexibility and excellence of service, proving the feasibility of higher-voltage transformation near the physical center of sizeable residential loads.



Modernizes

Nevada utility completes program

Isolated by miles of desert and far distant from sources of either adequate water power or fuel, the Elko-Lamoille Power Co. at Elko, Nev., is no less modern than its contemporaries. A modernization program begun in 1937 has recently been completed by Allen G. McBride, vice president and general manager.

Expansion began in 1937 with the addition of a new section to power plant to house a new diesel engine unit. The original plant contained four diesel engines with a total capacity of 1,800 kw. Space was also provided for an additional engine in the future. Late in 1940 the old building was torn out, a temporary housing placed over the four original engines, and the new wing extended over the entire group to make one complete new building.

Engineers were W. Harry Archer and Associates of San Francisco. Under their direction, not only the new building and the installation of the new engine, but also modernization of the pipe and flume line through the Ruby Mountains to the company's hydro plant at Lamoille some distance away was completed.

The new unit installed was a 750-hp, 257-rpm Busch-Sulzer diesel engine, direct connected to a 500-kw. G-E generator with a 15-kw. chain driven exciter. The engine developed 675 brake hp at the mile-high elevation at Elko. Switchboard and control equipment was also enlarged with the addition of a General Electric board at the same time. The plant now contains five engines, all of the same make, with provision for a sixth in the future.

An interesting by-product development was installed by the engineers. To heat the powerhouse during the winter, waste heat from the exhaust of three of the engines can be taken by means of a by-pass through a Paracoil waste heat boiler, manufactured by Davis Engineering Corp. of Elizabeth, N. J. Heat from the exhaust can be absorbed in the boiler and recirculated by means of heated water through 14-unit heaters backed up by fans, located in the plant, the machine shop and the plant office. Rating of the boiler is 600,000 btu per hour. Manual control permits intermediate adjustment of the heat drawn from the exhaust. Otherwise exhaust is through a muffler to the open air.

The system serves chiefly residential and business around the city of Elko and a large icing plant for the transcontinental rail freight lines. The hydro plant, a 125-kw unit, is operated in parallel with the diesel system. Dependent on stream flow entirely, improvements to the pipe line resulted in savings of water. The pipe line was relocated, a tunnel driven through the mountain, at one place the pipeline carried over a canyon by a suspension bridge instead of a trestle, and many kinks removed from the system.

A new power house wing (above left) was built to replace an older structure and an exhaust waste-heat heating system installed. At the same time both outside and inside of the offices were modernized, the job including fluorescent

ASA Tech. Abbrev.

New standards adopted for many technical and scientific terms

CONFUSION and lack of uniformity in the use of abbreviations in technical literature should disappear with the further adoption of new standards which have just been issued by the American Standards Association as ASA publication Z10.1—1941. Titled "Abbreviations for Scientific and Engineering Terms," the publication represents two years of work by a committee of editors, educators and engineers on revisions of previous standards developed in 1931.

In the introductory notes attention is drawn to the fact that abbreviations should be used sparingly and with due regard to the context and training of the reader. Short words should be spelled out. In case of doubt, words should be spelled out. The same abbreviation is used for both singular and plural. The period should be omitted. Sentences should not begin with a numeral followed by an abbreviation.

Some of the standard abbreviations applying specifically to electrical terminology include the following:

ampere	amp
ampere-hour	amp-hr
Angstrom unit	A
British thermal unit	Btu or B
candlepower	cp
circular mils	cir mils
coulomb	spell out
current density	spell out
cycles per second	spell out
decibel	db
degree Kelvin	K
direct current	d-c
electric	elec
electromotive force	emf
farad	spell out or f
foot-candle	ft-c
foot-Lambert	ft-L
frequency	spell out
horsepower	hp
horsepower-hour	hp-hr
hour	hr
kilovolt	kv
kilovolt-ampere	kva
kilowatt	kw
kilowatthour	kwhr
lumen	l
lumen-hour	l-hr
lumens per watt	lpw
megacycle	spell out
megohm	spell out
milliampere	ma
millivolt	mv
National Electrical Code	NEC
ohm	spell out
potential	spell out
power factor	spell out or pf
reactive kilovolt-ampere	kvar
revolutions per minute	rpm
volt	v
volt-ampere	va
watt	w
watthour	whr

The pamphlet, which contains several hundred abbreviations, may be secured from the American Society of Mechanical Engineers, 29 West 39th St., New York, under the title listed above for 35 cents.

● BUREAU OF RECLAMATION has awarded contracts to Nehring Electrical Works of DeKalb, Ill., and Anaconda Wire & Cable Co. for two additional transmission lines to carry power to the Tucson (Arizona) Gas, Electric Light and Power Co. and the Imperial Irrigation District. Nehring will furnish 360 miles of 7-strand, hard-drawn bare copper conductor for $215,729, for a 110-mile 115-kv. line from Phoenix to Tucson, by way of Coolidge. Anaconda's low bid of $135,212.52 was for 144 miles of hollow hard-drawn bare copper conductor for a 50-mile 161-kv. line between Blaisdell, Ariz. to power Drop No. 4 on the All-American canal. The contractors must furnish one-third of the order within 90 days, one-third within 120 days and the balance within 150 days.

Line Crew Safety

Periodical inspection of all gear helps PGE to reduce accidents

Once a month when the 115 members of the Portland line department of the Portland General Electric Co. gather for their regular first aid meeting all gear is brought along for inspection. Rubber and leather gloves, safety belts and climbers are laid out on a long table for careful scrutiny under the supervision of L. D. Simpson, line foreman.

While the man are in the meeting a selected team goes over every item of equipment looking for weak spots or defects. All gear is ticketed for repair or replacement when its condition indicates this is necessary.

This precaution has been instrumental in reducing accidents and in maintaining an appreciation among the linemen of the necessity for maintaining gear in first class condition.

Portland General Electric linemen check the condition of all gear at the regular monthly first aid meetings held by the Portland line department Here are Pat O'Connor, Maurice (Slim) Battin and Lee Simpson doing the job

Scale drawing (above) shows line routes and construction required

PGE-Bonneville Line Static-Free

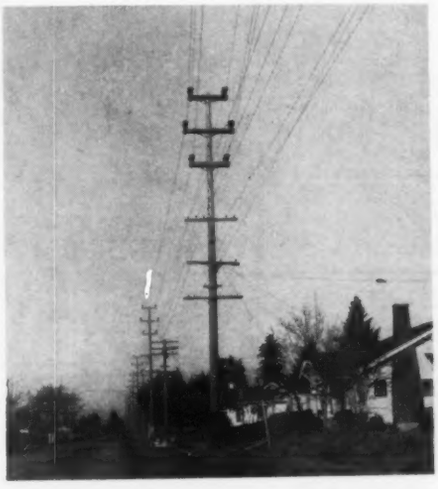
Five circuit construction incorporates radio interference-free insulators

PORTLAND General Electric Company (Portland, Oregon) decided that it would be advisable in taking energy from the Bonneville Power Administration's main receiving substation in Portland to provide five 57.1-kv. circuits from the substation to its own substations located at various points in the city. Bonneville agreed to this arrangement and laid out its substation to provide for these five circuits.

Facilities to receive this power involved both new lines as well as the reconstruction of some existing lines. Three of the circuits were on the east side of the Willamette River and two newly laid oil-filled submarine cables carrie denergy across the river to tie into the 57.1-kv. facilities on the west. These cables paralleled the 115-kv. circuit of the Bonneville Power Administration which extends south of Portland to Eugene. All were redy to tie into the Bonneville substation prior to its completion. Consequently in the case of some of the lines, it was necessary to effect temporary connections initially in order to take power at the time it was required.

Naturally in constructing these five circuits from the Bonneville substation, located just outside the northwest boundary line of the city, to the company's existing substations located at various points in the city, it was necessary to select suitable routes and to construct the lines so they would not be objectionable to the property owners or people living along the streets traversed by the circuits. As some of these circuits pass through residential areas, it was particularly necessary to make them free from radio interference.

The City of Portland readily granted the necessary permits for the construction of these five circuits on the assurance that the company was using due care in selection of the routes and in the use of construction and insulators which would make the circuits free from radio interference.



All except two of these five circuits tie into and form a part of existing 57.1-kv. circuits as shown in accompanying map of the circuits, and in all of the new construction, a total of 18.4 circuit-mi., Westinghouse RIP pin-type insulators were used. Part of one circuit has been reconstructed using new conductors and Ohio Brass clamp-top pin-type insulators. No radio interference complaints due to these circuits have been received since they have been placed in operation.

No. 2/0 bare, hard-drawn, stranded copper conductors were used in all of the new construction and reconstruction with the exception of 5.9 mi. of one circuit to Knott Substation, in which No. 4/0 ACSR conductors were used.

In leading away from the Bonneville substation, on account of the lack of highways, separate pole lines could not be built, and for a considerable distance two circuits are carried in each direction on a single pole line and the fifth circuit on a single pole line on the opposite side of the highway from one of the double-circuit pole lines.

The accompanying pictures show some of the double-circuit and the single-circuit construction and the character of the residential area through which some of the circuits pass, and the area near the main receiving substation of the Bonneville Power Administration.

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO

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The Public Speaks

THE "Front Door Ballot Box" conducted by Dan E. Clark II in Salem and Woodburn, Ore., on the question of public power, results of which are announced in this issue's news, must have been a shock to the Bonneville administration. For the first time in our knowledge an attempt has been made to sound public opinion on the clear-cut issue of whether or not there should be a federally-dominated, public power monopoly in the Pacific Northwest that would wipe out the private utility industry. The results of the polls were overwhelmingly in favor of a continuation of free enterprise under the regulated private utility system, and this, significantly, in two spots singled out by the Bonneville people for the application of pressure in favor of public ownership.

This whole Northwest public power campaign, headed by Secretary Ickes and administered by his Bonneville organization, has been predicated on two points: (1) That private company rates are too high and that public power will correct this; and (2) that the people want public power. Both of these ideas were knocked sky-high in the Salem and Woodburn polls with simple, clear-cut questions, free from any "witch words" or deceptive phraseology. On the rate question, six people out of seven said the Portland General Electric Company's rates represented a fair price for electric service. On the general question pertaining to the continuation of private enterprise, more than two persons out of three preferred free enterprise as represented by the private company. And on the Columbia Power Authority bill now pending in Congress, the vote was 2 to 1 against in Woodburn, and 2½ to 1 against in Salem. Can it be that Bonneville's propaganda machine is mis-firing?

Editors of most of the newspapers of Oregon and Washington in recent weeks have been turning a revealing spotlight on the move to socialize the Northwest power industry by creating a public power monopoly directed from Washington, D. C. They have pointed out that the scheme throws state rights and home rule out the window; that the Secretary of the Interior would, in fact, be the power dictator; that through this dictation he would exercise far-reaching control over the economic destinies of the region; that the people do not want this sort of a deal; and that they should be given an opportunity to express themselves on it before it is put into effect.

Proving that the people actually were against it has been a hard thing to do. The Bonneville propagandists pointed to the large number of PUD's that have been formed in the region, ignoring the fact that many of them were voted before Bonneville became an issue. Ignored too was the fact that these PUD's in many instances were formed more for a club to hold over the private utilities than for any other reason. Nor is mention made of the over-all vote on all the PUD elections in the two states since 1932—a majority against district formation of 155,000. In recent elections also, notably Spokane, Astoria and Baker, the trend has been decisively away from public ownership, now that the full implication of the Bonneville-PUD combination is better known.

The Salem and Woodburn polls tend to corroborate this in a conclusive manner, and there is little doubt that if a popular vote were taken in the two states today on the issue of the Columbia Power Authority as outlined in the administration-sponsored bill now in Congress, the people would turn thumbs down. Surely some way will be found to bring this point home to Congress, and surely that body will devise another type of authority that will preserve free enterprise and home rule in the Pacific Northwest.

More Engineers

INDUSTRY is paying the price for its neglect in finding a place for the engineering graduates of the depression thirties. Now, with a colossal industrial expansion program on its hands, there is a premium on engineers of all kinds. This shortage of engineering talent bids fair to become more

and more acute. During the lean years of the last decade there was little recruiting of new men to fill the gaps caused by death, retirement and departure to other fields. Instead, the young engineers leaving the colleges and universities sought employment elsewhere — they became salesmen, merchants, insurance men, anything as a matter of fact that would bring a livelihood. To all intents and purposes they were lost. Now industry, in dire need of trained manpower, must pay the price.

There may be a partial remedy for the situation. If these engineering graduates have not been completely submerged, if their whereabouts can be determined, they might be brought back into industry. Many of the universities are providing so-called "refresher" courses that would fit these men for engineering jobs. This may fill the need.

The Code and Human Nature

MISTAKE made all too easily by lawmakers —and the makers of the National Electrical Code in a sense are an electrical congress who write a code of wiring law—is to devise a law perfect technically and expect it to work among imperfect human beings. The great unknown, human nature, is an unpredictable coefficient in any otherwise logical equation.

With genuine concern those who believe in the Code are admonishing electrical inspectors to resist an old temptation in respect to the 1940 edition of the National Electrical Code. The trend of recent years has been to accept the Code as the best possible compromise of everyone's interests. More and more city inspection departments had been dropping the idea that their own local conditions were so peculiar that they needed a tailor-made code of their own.

Yet the 1940 Code has brought such a cool response that concern over its adoption is real. In many localities it is being treated to "passive resistance," in others accepted with such reservations as to nullify much of its value.

It is a good code, seriously and carefully arrived at, and even the confusing wiring tables are the product of honest engineering study and findings. But it is bogged down on the coefficient of human nature—some call it cussedness.

For one thing, to most inspectors *reactance* is a stranger. It is a new factor which they have never before had to take into account. It complicates familiar old rules of thumb used to calculate mere *resistance*. Fat copper sizes seemingly big enough physically to carry all sorts of amperes are now described as being incapable of half holding up their own. The reality, in view of past belief, is just not humanly believable as yet.

But meetings such as that of the Southwestern and Northwestern Sections of the International Assn. of Electrical Inspectors are bringing a better recognition of this strange reactance. It is bringing too a realization that engineering fact cannot be simplified by ignoring it. If it is true that there are these phenomena, and it is, then to simplify the code, a job of selection must be done—selection of a few wires from the many, for instance—so that whatever is selected can be fully learned about and understood.

In the mood of self denial which a national emergency creates, more progress should be made in such a selection for simplification than might be possible otherwise. Likewise in such a public spirited mood more inspection departments should be willing to relinquish special rules and even local codes in the interest of national unity.

Then once again the Code can decide.

Despicable Selling

NOTHING is more despicable than the ghoul who robs the victims of disaster. Very little less reprehensible is the one who takes advantage of today's eager market to sell junk or gyp equipment or apparatus. Just because the customer is so in need of equipment that he buys without examining and comparing is no reason why he should be victimized so unscrupulously.

One of the numerous cases in point is that of peddling cheap, poorly made, badly performing fluorescent lighting fixtures on an unsuspecting public. It may be easy to sell and easy to evade responsibility, but in the long run it is so costly as to make anyone with sense avoid doing it. Certainly those with principle will not.

The salesman or dealer in that sort of thing not only sacrifices his own prestige cheaply, but loses money, for he could make more profit by selling a good job. Besides that he makes a bitter, dissatisfied customer who will ever afterward be resentful of him and of the entire electrical industry.

FACED with the inability to supply our customers in some instances wholly, in others partially, we are neither putting up a "sold out" sign nor closing our offices. For equal in importance to the day-to-day sales job is a new necessity to satisfy our customers as best we can and save them for the future. This, in itself, is a selling job and it is up to our selling division to meet it with the same ingenuity we would use on any peacetime selling problem.—Harold E. Searle, International Nickel Company.

Inspectors Face Emergency

Southwestern Section annual meeting at San Jose reviews Code changes and materials situation

TOUSLEY—KIMBALL

CONSIDERING the "absent treatment" to which the new wire tables of the 1940 edition of the National Electrical Code is being subjected by California inspection departments there was surprisingly little discussion of this subject at the International Assn. of Electrical Inspectors Southwestern Section 18th annual meeting at San Jose, Calif., Aug. 25-27. In fact, from a code revision standpoint there was little of the hot argument which characterized the thin-wall and bare neutral proposals two years ago in San Francisco at the joint meeting of Northwestern and Southwestern sections.

Instead it was a well timed, orderly, serious convention, well attended and well supplied with experts and authorities from national organizations. The only subject to get a workout on the floor was that of type S or tamper-resisting fuses, the California inspectors rather unanimously feeling that just two amperage steps would not be in accord with the reality of appliance and high wattage floor lamp loading on domestic wiring circuits. They felt there should be three steps—one of 15 amp., one 20, the third 25 amp., consistent with the wire carrying capacities set up in the new Code.

Distinguished this year by having the international president from its own region, the Section will loan him to the other Sections for a series of similar meetings, of which this was the first. George E. Kimball, electrical engineer, California Industrial Accident Commission, San Francisco, is president of IAEI this year. The convention was conducted by Otis W. Newcomb, chief electrical inspector, Long Beach, president of the Section.

In his presidential address, George Kimball told inspectors to acquaint themselves with the managements of defense factories, offer their services for the prevention of electrical fires and accidents and to promote increased production ."The offer can be made in such a way," he said, "that the management will be glad to accept it. That, after all, is something they are paying for in taxes and to which they are entitled."

Among the activities of IAEI which he reviewed he mentioned a new committee on portable cords to study uses and applications of heavy duty cords where they are a "life saver for industry" in service to portable lighting systems and portable welding systems in shipbuilding and for portable tools. "Where properly installed, connected and protected from overloading and from severe mechanical injury," Kimball said, "cords and cables are safer and more satisfactory for temporary installations than rigid conduit, armored cable or electric metalic tubing."

Mentioned in his address as well as in the committee report on accidents and fires was the number of fires caused by breakdown of fractional horsepower motors, especially in refrigerators. According to Harry Dobson, Santa Barbara chief inspector who reported on fires, motor fires surpass in number and damage the old offender, the electric iron left on.

President Newcomb's address was a new precedent in streamlined brevity. He said that scarcity of trained men in his own profession, of skilled electrical mechanics, suitable materials and the use of substitutes and the restrictions of priority ratings confront inspectors with serious problems.

A New Wrinkle—Reactance

At the noon luncheon Monday A. B. Smedley, Anaconda Wire & Cable Co., Los Angeles, in the course of an entertaining and instructive demonstration talk on wiring adequacy, "Copper and Kilowatts," introduced the inspectors to a new wrinkle—reactance. He also presented an acceptable logic for the new wire tables and "ambient temperature." But it was perhaps in showing that after wire sizes reached the size of No. 4/0, reactance began to cause more voltage drop than resistance on alternating current, and that after 500,000 cir. mil was reached there was neither sense nor current in going any higher that he did the most for the group. Instead it was much more economical and efficient to parallel such heavy feeders, he demonstrated. Oddly, the bigger the wire, the less current, because of reactance, not resistance.

Power factor, also simplified by Smedley, was the subject of the first Monday afternoon paper by W. P. Bear, Pacific Gas and Electric Co., San Francisco. Impressing with his huge figures of kilowatt-hours lost just in charging up equipment and lines on a system as large as that of this utility—about 30% of the total kw.-hr. sold—Bear showed how costly just one percent additional loss due to poor power factor was—a million dollars a year in additional system capacity investment. Relation of such losses to rates, the discrimination which poor power factor customers enjoy at the expense of other customers, were angles he covered. Advantages to both customer and utility in correction of poor power factor were shown.

Cellular metal floor raceways, new to the West, were described in considerable detail and illustrated by some 50 slides in a talk by Joseph J. Siddall, electrical engineer, H. H. Robertson Co., Pittsburgh. Such steel cell flooring serves also as raceway for electrical circuits.

Tamper-resisting Fuses

Reviewing the history of the demand for and developments to supply non-tamperable fuses and bringing the latest news on the situation, J. C. Ingram, Bussmann Mfg. Co., St. Louis, opened up the one topic that drew fire. A number of California municipalities have braved the legal hazards in demanding the use of non-tamperable fuses in new construction where the square-foot rule applying to branch circuits is allowed and have been so eager that the manufacturers get together and standardize on bases or inserts that two chapters of IAEI in California sent resolutions urging them to hurry up.

Alvah R. Small, chairman of the Electrical Committee, described how Mr. Bussman, told how Thomas Edison had donated his patents on the screw shell receptacle to the public, decided to turn over to the public, through the Electrical Committee, his patents on the base or insert for non-tamperable fuses. Now any manufacturer of fuses may employ these standard dimensions for

TEST-TUBE BABY... it brings cable mortality rates 'way down!

IT'S NOT a very handsome baby as babies go. But, in action, you'll recognize a great basic improvement in impregnated paper power cable. It is Anaconda's new construction known as Type CB*.

It was born in the Anaconda laboratories, when an engineer applied the principle of conditioning oil by the introduction of carbon black, in a series of experiments then being carried on.

This principle when applied to paper-insulated oil-impregnated cable more than trebled the life of the cable, under accelerated aging tests.

And therein lies a story:

It is the story of Anaconda research... research that has produced scores of test-tube babies whose method of creation has been a boon to wire and cable users. In addition to Type CB, there is Sunex Securityflex*, the cable that operates as efficiently 10,000 ft. high in the mountains as 3,000 ft. below the earth's surface.

There are a host of other Anaconda products with special properties for standard and special wire and cable requirements . . . one or many of which may suit your particular conditions. Put them to work for you! *Reg. U. S. Pat. Off.

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the making of tamper-resisting fuses.

Ingram, however, reminded that ordinary fuses are tested to carry 110% of their rating continuously, and to blow at 135% in the open, 125% when enclosed. But motors require higher starting currents and much of domestic electric usage is with motorized appliances. To this usage much fuse blowing is attributed, and consequently much tampering and bridging. Fuses on motor circuits, Ingram declared, need a time-lag characteristic to tide them over the starting hump.

Later, when the type S fuse sections of the 1940 Code were being discussed for revision, it was clarified that the Electrical Committee had approved and the Code contained provisions for but two sizes of tamper-resisting fuse holders, and the agreement on the insert standardization covered but these two—one for 0 to 15 amp., the other for 16 to 30 amp. The Code. however, specifies as safe carrying capacities for No. 14 wire, 15 amp.; No. 12 wire, 20 amp.; No. 10 wire, 25 amp. With only one base, adaptable for anything between 16 and 30 amp., it was contended in the discussion that overfusing would still be done if a 20-amp. fuse failed to hold a load, and that such fusing would not protect one of the greatest hazards, the small sizes of cord used on portable lamps of high wattage. It was voted, after warm discussion, to request code revision to require three sizes of fuse holders—15, 20 and 25 amp.

Small circuit breakers, rivals of the fuse, next had their innings in a paper prepared by Charles Dean, engineer, Westinghouse E & Mfg. Co., San Francisco, but read in his absence by Roy J. Walker of the same company, Los Angeles. After telling of circuit breaker development, he announced that a new design of breaker, combining thermal operation and magnetic trip was now coming out. He said that it would completely protect No. 14 branch circuit wire, provide protection too for No. 18 cord over almost the complete range, ride through momentary safe overloads inherent with motor driven devices and type C lamp loads, and yet operate to open instantaneously on short circuits exceeding 200 amp.

Familiar by now with fluorescent lamps, inspectors have not had so much experience with other mercury vapor lighting, so R. E. Lagerstrom, illuminating engineer, General Electric Lamp Dept., explained and showed samples of the various type H or mercury lamps. These included lamps of from 100 to 1000 watts, with a range of pressures from one atmosphere to 100 and requiring water jacket cooling; the ultra-violet producing lamps used to activate fluorescent paints and dyes and the new reflector sunlamp containing its own auxiliary, a tungsten filament ballast which also starts the lamp. He also showed the rectified fluorescent lamps, outgrowth of old Cooper-Hewitts, and a laboratory sample of a new 3,000-watt mercury lamp expected to deliver 18,000 lumens at an efficiency of 45 to 65 lumens per watt and to be used to get 40 to 50 foot-candles of illumination at working plane from high mounting heights.

Joint Meeting

Electrical Contractors Assn. of Northern California joined with the inspectors for the Tuesday morning session, holding a business meeting of its own that afternoon while the inspectors made a trip to the Permanente Cement plant. The contractors' meeting is reported separately in this issue.

Recessed lighting fixture installation problems were discussed and demonstrated by Robert Dummel, illuminating engineer, Holophane Co., San Francisco, to open the Tuesday session. Thermal difficulties are the most serious and take good design, he illustrated, yet because of the growing trend toward lighting that is integral with the building architecture, these problems need to be studied and solved.

As another aid to the inspector to obtain better public understanding and cooperation for his work, the public relations committee of IAEI prepared a 10 minute radio transcription. J. W. Whittington, of NEMA, in New York, and chairman of the committee, arranged with station KQW at San Jose for its broadcast and then gave the convention an audition of it.

A recent wiring development, bus distribution duct, is being employed extensively by industrial plants because of its extreme flexibility. A rather complete description of it and its installation was given in a paper prepared by A. A. Schwartz, Safety Electric Co., San Francisco, and read in his absence by Mr. Shirley.

Telling of the Underwriters Laboratories Inc. and its relationship to electrical inspection, R. Shepard, chief electrical engineer, clarified its standing, described its electrical testing procedure and activities, and told of the field activity carried on in support of its testing and labeling of electrical materials.

Rather complete was the explanation of voltage drop calculation to be made on wire runs in accord with the 1940 Code by Arthur Abbott, of NEMA, New York, and author of the National Electrical Code Handbook.

Victor Tousley, secretary-treasurer of IAEI, and field engineer for NFPA, plead eloquently with inspectors to stop the trend, once stopped but now reappearing, to deviate from the Code in local rules. Reminding them that they helped write the Code in their meetings and discussions, that the Electrical Committee represented a true cross-section of the industry, and specifically that the wire tables to which some disagree. were arrived at by study and careful engineering, he urged a return to "Let the Code decide."

DIXON, SNEDAKER, BUTCHER
Hosts to the Convention

Wire Simplification

This meeting of inspectors did not argue the new wire tables of the Code. But perhaps more eloquent was the fact that not a city represented has yet adopted the 1940 Code in its entirety, including these tables. No resolutions were passed or action taken, because the matter of code revision is in the hands of the Electrical Committee. But the convention did listen with interest to Howard H. Weber, sales engineer, U. S. Rubber Co., when he proposed simplification of wires and cables by eliminating many sizes, standardizing on one or two better and more heat resisting insulations, and simplifying the wire tables. He urged support of the proposals made to the Electrical Committee by George Andrae of Milwaukee, claiming also that simplification would save copper needed now in national defense.

From this the meeting turned to suggested changes to the code, to be made before the next edition in 1943. Suggestions received from article committees were read and discussed and in some cases recommendations voted as guidance to the executive council. Beside the type S fuse recommendation, a vote was taken on recommendations to reduce the number of outlet boxes, and to permit the threading of thin wall conduit, especially in view of substitution of enamel for zinc as a coating, since enamel may reduce the bonding continuity of tubing and fittings. Ralph Wiley, chief, department of electricity, San Francisco, handled the

FORTY-NINERS

SCORE 500 VICTORIES FOR BETTER LIGHT-BETTER SIGHT IN 5 MONTHS!

Inspire 50-footcandle installations in stores, offices, and factories where higher lighting levels speed sales, improve work and boost production.

THAT HIGHER LEVELS OF LIGHTING are being sold and bought is evidenced by the 500 50-footcandle installations reported by the Forty-Nine Footcandle Club between March 1, and August 1, 1941. Indicative of the gains that fluorescent lighting is making is the fact that more than 78% of these installations are MAZDA F! Of the 500 installations, 51% are office, 32% are commercial, and 17% are industrial. They cover 2,843,795 square feet—more than 65 acres—and average approximately 3 watts per square foot.

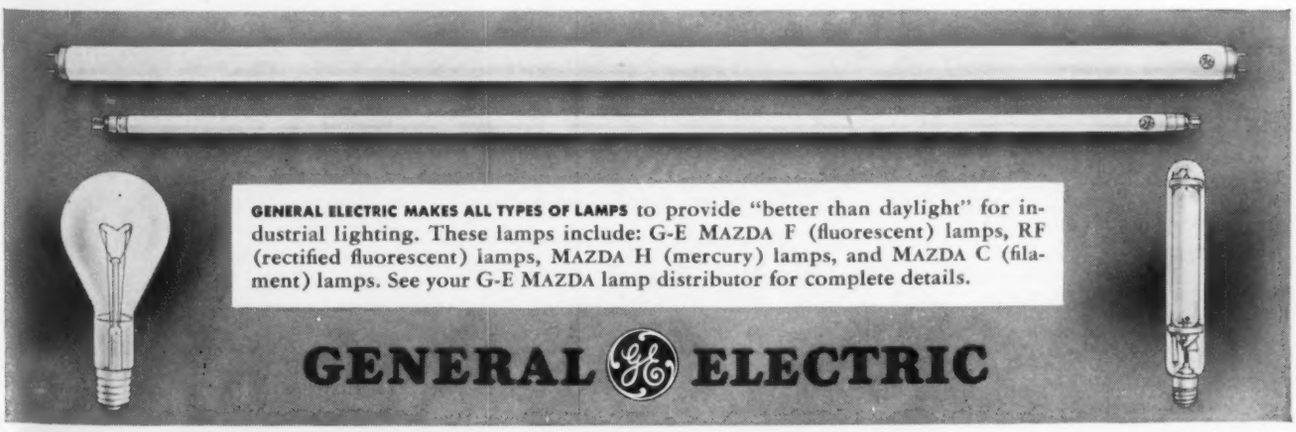
ALL OF THESE INSTALLATIONS represent constructive selling and intelligent buying to provide higher levels of lighting so urgently needed for more efficient working conditions in offices, better selling conditions in stores, and for faster production in industry, especially defense industries. Primarily they demonstrate that more customers have recognized the need for properly engineered lighting . . . the amount of light that helps them work more efficiently.

NATURALLY THERE ARE other 50-footcandle installations scattered throughout the country not inspired by the Forty-Niners' Club, but the fact is that those participating in the 49-Footcandle Club are doing a swell job. If you don't have your share of 50-footcandle installations on your lines, General Electric will be glad to help you organize your own 49-Footcandle Club.

Membership is open to salesmen primarily responsible for selling installations of 49-footcandles or more, or to executives working under 49 or more maintained footcandles. The attractive emblem shown here will be sent to all members. A brief description of the installation, attested by the sales manager, is all that is necessary for membership. Send it to: Secretary, Forty-Niners' Club, General Electric Company, Nela Park, Cleveland, Ohio or consult your G-E Lamp Division.

HIGHLIGHTS OF THE 500 50-FOOTCANDLE INSTALLATIONS

Total Square Feet covered		2,843,795
Total Watts installed		8,529,745
Total number of lamps used		125,928
Total number of fixtures		66,210
Average square feet per lamp for all sources		22.5
DISTRIBUTION OF LIGHT SOURCES:	MAZDA F	78.4%
	MAZDA C (incandescent)	10.4%
	Combination fluorescent and incandescent	6.8%
	RF—85 watt	2.0%
	Combination mercury and incandescent	1.4%
	MAZDA H (mercury)	1.0%
		100.0%



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GENERAL ELECTRIC

clearing house committee report in the absence of R. H. Manahan, chief of the electrical division, Los Angeles.

Fresno was selected for the next meeting place in order to return to the more effective custom of locating the convention city in the vicinity of the president, a custom that was thrown out of step by a joint convention with the Northwestern Section in 1937.

Clifford Prudhomme, Sacramento city inspector, was elected president; O. B. Butterfield, of Torrance, Calif., first vice president; Nick Siggins, San Francisco, second vice president. Harold Gerber, chief inspector, San Francisco, was reelected secretary-treasurer. To the executive committee were elected James I. Dixon, Santa Clara, W. J. Tretheway, Huntington Park; Otis W. Newcomb, Long Beach, and C. E. Heise, representing associate members. Representatives on the executive council, IAEI, were reelected. They include B. C. Hill, G. E. Kimball, G. E. Price, R. W. Wiley, and R. H. Manahan. Representatives on the Electrical Committee, R. H. Manahan, and B. C. Hill, as alternate, were reelected also.

Convention arrangements were ably handled by E. H. Snedaker, city electrician, San Jose, as chairman of the convention committee.

Contractors Learn

Defense program opened to subcontractors

Two congressmen addressed the special meeting of the Electrical Contractors Assn. of Northern California held after a joint meeting with the electrical inspectors, Tuesday afternoon, Aug. 26, at Hotel de Anza, San Jose. They brought a message of sympathy with and support for the small business man caught in the defense emergency and because of lack of defense business, faced with shortage of materials and manpower to keep business alive.

Richard J. Welsh, congressman for San Francisco, and Jack Anderson for San Mateo county were guests of W. J. Varley, business representative of the electrical contractors who had just returned from Washington D. C. Welsh expressed a surprising grasp of the situation and pledged support to a change in government policy which has let all defense work to general contractors alone. Anderson too declared that in the rush of getting work started the little contractor had been neglected. He deplored the lack of unity in the nation and declared that much of it was due to such causes as this.

Varley reported on contacts with high heads of departments in the navy, army and maritime commission. Appropriately he visited Washington immediately after the building trades departments of the American Federation of Labor and government agencies in charge of defense construction had entered into an agreement for uniform overtime rates, shift work, no work stoppages, employment of subcontractors, wages, apprenticeship and which provides a board of review.

As a result, Varley was able to start action immediately to open up to subcontractors work which until then had been forced on the general contractors to the detriment of electrical subcontractors.

Under terms of the agreement between AF of L with the government agencies, overtime is to be paid at time-and -a-half instead of double-time, shift work permitted, and there are to be no stoppage of work. Electrical contractors doing defense work are to get these same conditions instead of being discriminated against by shipyards and general contractors, which have had such conditions.

Varley advocated strongly that small contractors join together to form new syndicates or companies to bid for defense housing. He strongly recommended national association membership in order to maintain contact in Washington with the government.

Report was also made of the legislation passed at Sacramento which strengthens the Contractors License Board in the enforcement of the laws governing building and construction. Roy Butcher, electrical contractor of San Jose, and chairman of the state Contractors License Board, then announced that beginning Sept. 1, applicants for electrical contracting license would have to take a qualifying examination. In similar examinations for other crafts many incompetent applicants were eliminated from entering a business they could not conduct properly.

Dan Bronson, California Electric Co., Oakland, president of the association appointed a committee to meet with regional labor representatives to speed the putting into effect of the defense labor agreement.

NWEL&P Elects

Sam MacFadden as its president for 1941-2

Sam P. MacFadden, vice-president of Puget Sound Power & Light Co., Seattle, was elected president of the Northwest Electric Light & Power Assn. at its annual meeting in Portland. He will serve one year, succeeding C. J. Strike, president, Idaho Power Co., who has held office during the administrative year just closed. MacFadden has held an executive position with the Puget Sound company since 1932.

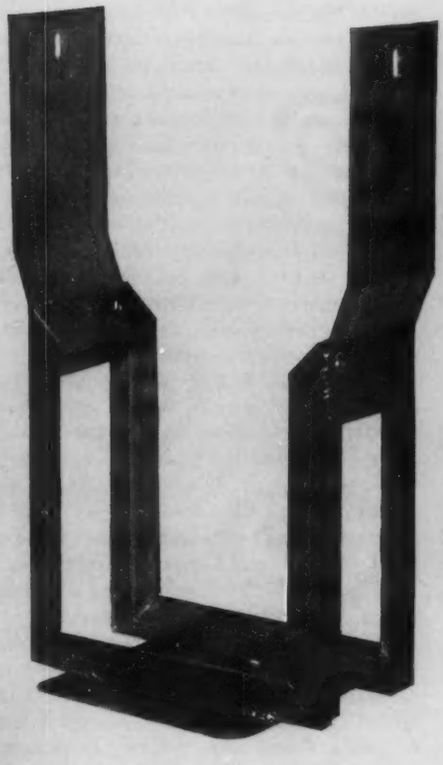
SAM MacFADDEN

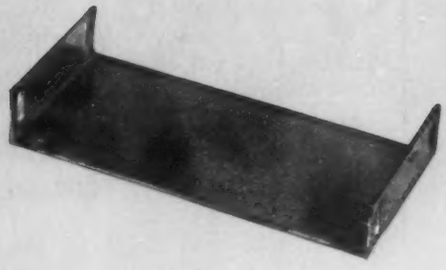
J. A. Hale, vice-president, Utah Power & Light Co., Salt Lake City, was named vice-president of the association at the same meeting. Vice-presidents for each state in the association territory were elected as follows: Idaho, R. S. Overstreet, Idaho Power Co., Boise; Montana, M. E. Buck, The Montana Power Co., Butte; Oregon, James H. Polhemus, Portland General Electric Co., Portland; Utah, W. A. Huckins, Utah Power & Light Co., Salt Lake City; Washington, D. B. Leonard, Pacific Power & Light Co., Yakima; and the province of British Columbia, W. C. Mainwaring, B. C. Electric Railway Co., Vancouver.

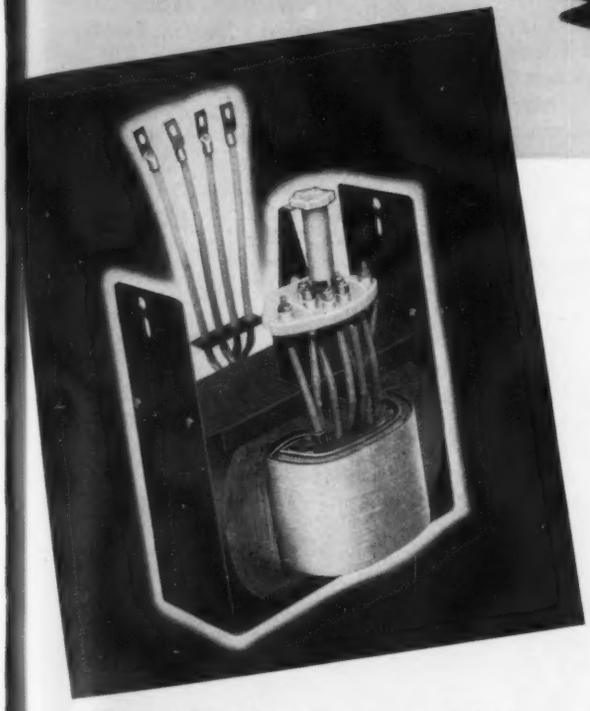
Elected members-at-large of the executive committee were, to represent the utilities, J. E. E. Royer, The Washington Water Power Co., Spokane; to represent jobbers and manufacturers, Harry A. Rogers, General Electric Supply Corp., Spokane, and H. C. Frost, Hurley Machine Co., Portland. Carrying hold-over terms on the executive committee are C. J. Strike, retiring president, and Z. E. Merrill, president, Mountain States Power Co., Albany.

President MacFadden appointed Berkeley Snow, Portland, executive secretary, and J. E. Anderson, Puget Sound Power & Light Co., Seattle, treasurer. He likewise appointed the following section chairmen for the year: Accounting & Business Practice, J. R. Thomas, The Montana Power Co., Butte; Business Development, D. J. McGonigle, The Montana Power Co., Butte; Engineering & Operation, M. T. Crawford, Puget Sound Power & Light Co., Seattle.

First Kuhlman B. I. Core Celebrates its 12th Birthday







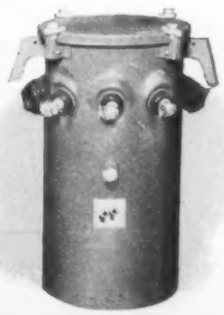
Shown in the colored panel are (1) the Kuhlman Bent Iron Core as it was first built in 1935, (2) the frame for the core, and (3 and 4) the original top plate and porcelain terminal block. Immediately above is shown the Kuhlman B. I. Core as it is built today.

B. I. Core of today incorporates many improvements

It was a mighty important step forward when, in 1929, Kuhlman's chief engineer, W. F. Gakle, developed a one-joint laminated core that could be formed around the coil. In brief, the Kuhlman Electric Co. made transformer history in 1929 by originating the Kuhlman Bent Iron Core.

Laboratory and field tested for six years the Kuhlman B. I. core was put into production in 1935 and since then has turned out to be the greatest improvement in transformer construction in 50 years.

Technically, the big advantage of this core construction is in its (1) direction of magnetization (2) single joint and (3) economical use of material. These factors bring about higher permeability, lower hysteresis, lower exciting currents, lighter construction, lower impedance and better regulation.



Improved and refined many times since its inception, today, the Kuhlman Bent Iron Core utilizes, to the fullest extent, the most desirable characteristics inherent in present day material. For further facts write today for Bulletin 413.

KUHLMAN ☆ ELECTRIC COMPANY

BAY CITY, MICHIGAN • OFFICES IN 40 CITIES

PCEA Panorama — Edited by Mary Shoop

Electriquiz

Test your general knowledge of the industry by marking these statements true or false The answers on page 87.

1. In California the "Constitutional Franchise" is the right to vote.
2. Maintaining good customer relations is the most urgent problem confronting a private utility company.
3. Power company employees not directly engaged in sales work have no opportunity to build load.
4. The California Railroad Commission is elected by the people.
5. Municipal ownership usually is urged for political expediency or personal gain.
6. Rates of municipally-owned utilities are fixed by the Railroad Commission.
7. Rate trends of electric utilities have been downward continuously since the World War.

To Charles Grunsky, chief engineer of Coast Counties Gas and Electric Co., Santa Cruz, goes the credit for this interesting Electroquiz.

Fall Conclaves to Fresno

Fresno will be the location of the annual PCEA fall conclaves with the Hotel Californian as conclave headquarters. First trial will be made of the new combination of the northern and southern conclaves into one statewide event, a change made at the suggestion of all three PCEA sections for the purpose of fostering a broader viewpoint on industry matters and a wider acquaintance among members.

The Operating Economics, Business Development and Administrative Services sections will hold simultaneous conclaves in Fresno Thursday and Friday, Nov. 6 and 7. The Operating and engineering group will hold an entirely separate session from the other two with its own program confined strictly to matters of interest to that group. The other two will meet jointly.

In order to assure conclave programs that are closely attuned to industry interest, guidance committees are giving even more than their customary careful attention to the selection of speakers and discussion subjects. The guidance committee of the operating economics section will meet in Fresno Sept. 5, while that of the administrative services section met in Los Angeles Aug. 29. The business development section guidance committee will meet in Los Angeles on Sept. 16.

Members of this year's guidance committees are:

Operating Economics Section—Chairman, H. H. Buell, PG and E, San Jose; vice-chairman, H. A. Lott, Southern California Edison Co., Los Angeles; E. D. Sherwin, San Diego Gas & Electric Co.; O. A. Gustafson, General Electric Co., Los Angeles; E. W. Morris, Westinghouse Electric & Mfg. Co., Los Angeles; J. P. Jollyman, PG and E, San Francisco; L. J. Moore, San Joaquin power division, PG and E, Fresno; F. D. Beardsley, Coast Counties Gas & Electric Co., Santa Cruz; A. C. Schwager, Pacific Electric Mfg. Corp., San Francisco; E. L. Brentnall, Okonite Co., San Francisco; W. W. LaBarr, Allis-Chalmers Mfg. Co., Los Angeles.

Business Development Section—Chairman, E. G. Stahl, PG and E, Fresno; vice-chairman, H. C. Rice, Southern California Edison Co., Los Angeles; P. P. Pine, San Diego Gas & Electric Co.; O. R. Doerr, PG and E, San Francisco; Milo Cain, Coast Counties Gas & Electric Co.; H. H. Fogwell, Thermador Electric and Mfg. Co., Los Angeles; A. J. Bronold, Westinghouse, Los Angeles; M. C. Hixson, General Electric Lamp Dept., Oakland; M. G. Sues, Leo J. Meyberg Co., Los Angeles; R. G. Hutchinson, Frigidaire Corp., San Francisco; A. B. Smedley, Anaconda Wire & Cable Co., Los Angeles.

Administrative Services Section—Chairman, S. W. Scarfe, General Electric Co., Los Angeles; vice-chairman, L. C. Rausch, Coast Counties Gas & Electric Co.; J. Beckett, E. A. Long and L. J. Neveramont, PG and E, San Francisco; R. R. Walbridge and F. C. McLaughlin, Southern California Edison Co., Los Angeles; Charles Davies and Wm. DeWaard, San Diego Gas & Electric Co.; C. P. Dayton, Sierra Pacific Power Co., Reno.

District Meetings

What every PCEA member wants to know to keep up-to-date on his industry will be contained in the timely program to be presented at the annual district meetings opening Sept. 29 and continuing through Oct. 17 in 15 California and Nevada cities. Questions submitted by PCEA members in the area where a meeting is held will be answered by outstanding industry men at an informal round table.

A review of general industry conditions as affected by today's fast moving events will be given by PCEA President G. C. Tenney. Newest developments in fluorescent lighting will be discussed by H. H. Green, prominent G-E lamp department engineer from Nela Park. The schedule for the meetings is as follows:

Reno, Sept. 29, Lawton Springs.
Chico, Sept. 30, Chico Art Club.
Sonoma, Oct. 1, Mission Inn.
Sacramento, Oct. 2, Elks Club.
San Jose, Oct. 3, Hotel Sainte Claire.
Watsonville, Oct. 6, Hotel Resetar.
Fresno, Oct. 7, Hotel Californian.
Bakersfield, Oct. 8, Motel Inn.
Santa Barbara, Oct. 10, Elks Club.
Santa Ana, Oct. 13, Masonic Bldg.
San Diego, Oct. 14, Hotel San Diego.
Alhambra, Oct. 15, place to be announced later.

(Con't. next page)

Rausch Scarfe Stahl Buell Lott Rice

Santa Monica, Oct. 16, place to be announced later.

San Bernardino, Oct. 17, California Hotel.

Who Am I?

I was born in Ogdensburg, N. Y., Oct. 18, 1888. I obtained my early education at the Free Academy there, and received a B.E. degree in 1911 from Union College, Schnectady. My first job was with the Aluminum Co. of America at Massena. I also worked with this company at the Bauxite producing plant in Arkansas and in preliminary engineering on hydro-electric developments in the Great Smoky Mountains of Tennessee and North Carolina. Who am I?

During the World War I was in the service doing ordinance department work. I joined the Pittsburgh Transformer Co. in New York in 1922. In 1927 the Allis-Chalmers Manufacturing Co. purchased this company. In 1929 I was transferred to Buffalo as district manager for Allis-Chalmers, and came to Los Angeles in 1936 as district manager, a position I hold today. Who am I?

I am a member of the board of directors of the Pacific Coast Electrical Association and first vice-president of the Los Angeles Electric Club. I am a member of AIEE, the Los Angeles Athletic Club and Chamber of Commerce. My fraternity is Alpha Delta Phi. I have been married 23 years, reside in Los Angeles and my name is: See page 87.

San Diego Bureau Meet

To discuss problems of moment

A type of meeting to answer the problems of the moment in electrical merchandising coupled with entertainment and fun is being planned for the annual banquet of the Bureau of Radio and Electrical Appliances of San Diego County, according to J. Clark Chamberlain, manager. It will be held at San Diego Hotel, Friday, Sept. 12, 6:30 p.m. Speakers and entertainment program have not yet been definitely announced.

Bureau advertising during August continued aggressively in support of electric refrigeration. Strong support for washers and ironers tied-in with the back-to-school idea, is scheduled for September. Plans in preliminary stages stages are already under way for the annual exposition just before Christmas.

RMEL Estes Program

"Futurama" of electrical industry to be presented

"Chief" Gaylord B. Buck and his "warriors" of the "Kee-lo-watt" tribe are on the move toward Estes Park for their annual pow-wow, Sept. 11, 12 and 13. This convention of the Rocky Mountain Electrical League will be host to affiliated "Kee-lo-watts" from more than one-half the states in the Union, according to "Medicine Man" George E. Lewis, manager of RMEL.

Most spectacular of the fun-and-feast features will be the fish fry at the Swiss Chalets (Stanley hotel's auxiliary "wigwam") where "Kee-lo-watts" will eat their own freshly-caught trout (with prizes to those reeling in the most); buffalo hump for those plains "warriors" whose tonsils are not attuned to mountain diet; and an Indian chief in war regalia (fluorescently treated) under influence of White Man's magic black light. This event will occur after the second day's business session, out of doors, mellowed by romantic Colorado moonlight.

Serious phases of the convention will take the form of a "Futurama" of the electrical industry. Eventualities related to length or brevity of the war will pervade all discussions and speeches. Past and present of electric utilities will be completely disregarded except as a basis on which to chart a future course along safety-illuminated military highways, in electric-powered defense industries—and beyond, to peace-time pursuits and sale of gigantic surplus kilowattage.

The Red Man's traditional campfire will be replaced by a battery of infrared lamps September 10, at the annual ceremonial gathering here of the Washakie Indians, whose reservation is near Lander, Wyo.

This innovation is being arranged thru the collaboration of the Mountain States Power Co., Hendrie and Bolthoff Mfg. and Supply Co. and Rocky Mountain Electrical League, with Harold F. Evans, Lander Indianologist, sports enthusiast and electrician who is chairman of the One-Shot Antelope Hunt lighting committee.

While the Washakie ceremonials will be pretty thoroughly invaded by white man's ideas, the 1941 version of ancient tribal customs retains their historic significance: The Redskins, since time immemorial have conducted their yearly war dances in the presence of a huge fire; thus the infra-red equipment will supply the usual illumination and create the proper color effect without the bother of replenishing the flames. Bucks eligible to participate in the war dance will wear costumes phosphorescently treated to glow under black light influence. And the "One-Shot" antelope hunting event is a revival (by crack marksmen from Colorado, Wyoming and Texas, who are allowed only one cartridge apiece) of the old Indian custom whereby young bucks plied bow and arrow, under strict competitive conditions, on buffalo.

W. D. Johnston, manager of the Mt. States Power Co., George Oliver, district manager at Riverton, Wyo., and F. O. Carlson, local manager at Lander, will supply electricity and technical talent for the occasion. Carl Rosser, representing Hendrie and Bolthoff, and George E. Lewis, RMEL manager, will provide electrical equipment.

● Certified Master Electricians is the organization which has replaced the former Old Baldy Council of NECA in the Pomona and Montebello section of southern California. A. M. Fitch is president and B. W. Jones of Pomona, secretary. Meetings are held on Fridays, three of the monthly meetings in Pomona and one outside of that city. One of the meetings is an educational meeting. Last month County Electrical Inspector Art Veit spoke on the county ordinance and wiring regulations for county work.

● Vancouver Electric Assn. held its annual banquet at Bowen Island, B. C., July 19. It was participated in by all branches of the electrical industry with the arrangements in the hands of a special committee of the association. The function was particularly well attended this year.

Agenda

Illuminating Engineering Society, San Francisco, Bay Cities Section, Sept. meeting, will be held at the Acme Brewery, where an exceptional lighting installation has been made in a new annex.

Pacific Division convention, National Electrical Wholesalers Assn., held Aug. 28-29-30 at Del Monte. Full details of the program will be published next month.

Southern Calif. chapter, IAEI, next meeting at Torrance, Calif., Nov. 19, 1941. Inspectors' problems will be the subject.

Electrical Contractors Assn. of San Mateo County meeting at Town House, Burlingame, Calif. W. J. Varley, San Francisco Electrical Contractors Assn., speaker, "Direct Hiring of Journeymen Electricians by the Government." Regular meeting last Monday of each month.

Air Conditioning Society of S.F. special meeting July 31 at Belleview Hotel to hear Carroll A. Snyker, of S.F. Chamber of Commerce, on "Priorities and How They Work."

Northwestern Section IAEI, 15th annual meeting, Tacoma, Wash., Hotel Winthrop, Sept. 2-5.

NEWS of the industry

SAN FRANCISCO TO VOTE ON HETCH HETCHY PLAN

Plan 9, involving a $65,500,000 revenue bond charter amendment to put the city of San Francisco into municipal ownership of its electric facilities, has been approved by Secretary of the Interior Ickes and is being readied for voters on the November 4 ballot. Fundamentally the plan differs little from the two previous measures submitted in 1937 and 1939, each of which was turned down by a substantial margin. Principal difference is in the amount of bonds authorized—$66,500,000 as compared to $50,000,000 and $55.000,000 in the two previous votes.

The proposed bond issue is divided as follows: $51.230,000 for purchase of Pacific Gas and Electric Co. facilities; $10,153,000 for enlargement of power generation and transmission facilities, $3,500,000 for additions and betterments pending acquisition and $1,617,000 for contingencies. Biggest indeterminate is the value PG and E will place upon its distribution facilities. These were evaluated by the California Railroad Commission in 1924 and the entire properties of the company were estimated to be worth $63,545,000 by the late city engineer, M. M. O'Shaughnessy in 1931.

Plan 9 derives its designation from the fact that it is the ninth municipal power proposal to be submitted to San Francisco voters since the controversial Hetch Hetchy situation developed. All eight previous proposals have been defeated. The forthcoming election has been forced on the city by Secretary Ickes, who won an injunction estopping sale of power generated at the Hetch Hetchy plant to Pacific Gas and Electric Co. through an agency agreement. Cancellation of the rights granted the city under original Congressional legislation is the threat held over voters in the present election. Under terms of an agreement with Secretary Ickes no other bond measures will be included on the November ballot, the present plant must receive active support from all city officials and no attempt must be made in the interim to amend the Raker Act to permit sale of city generated power.

Fiscal details of the plan include an estimated $16,500,000 of annual revenues at present rates and an estimated $5,233,000 annual surplus over and above operating expenses, interest and bond redemption charges. However it is pointed out that this indicated surplus makes no allowance for the present $2,400,000 annually the city now receives for its power. Also a 3% interest rate is assumed for the revenue bonds, an item likely to change before the bonds are sold. Furthermore no provision has been made for possible future rate reductions. There have been two major reductions since July, 1939.

We've Got Trouble?

Down in sunny Mexico where the consumer is always right—or at least will not admit he is wrong—the privately owned Nogales utility company is faced with a customer strike. Power users who for weeks have refused to pay their bills in protest of increased rates posted guards at strategic positions to prevent the utility from cutting off service. At the date of writing, there has been no violence although power company employees sent to pull switches or clip wires encountered the home guard at every turn. An injunction against the increased rates recently was set aside by the Federal Bureau of Economy, which held that the power rates were just. All past due bills were ordered paid. Residents immediately dug out candles and oil lamps and announced the electric power ban.

● REGROUPING plans filed by Cities Service Co. with the SEC call for the establishment of a holding company to take over operating companies in Colorado, New Mexico and Wyoming. It would be known as the Rocky Mountain Regional Corp. and it would acquire the following properties: Public Service Co. of Colorado, Albuquerque Gas & Electric Corp., Deming Ice & Electric Co., Las Vegas Light & Power Co., New Mexico Power Co., Cheyenne Light, Fuel & Power Co., Rawlins Electric Co. and Sheridan County Electric Co.

● SUMMER PEAK on the system of the Pacific Gas and Electric Co., caused by a combination of normal and defense demands totaled 1,194,700 kw., an increase of approximately 60,000 kw. over 1940. Peak day was July 22 when irrigation load was at its maximum. Kilowatt-hour sendout was 22,812,000, giving the system a load factor of 80.65 percent for the day.

LOS ANGELES ADDS SECOND UNIT TO HARBOR PLAN

Contracts have been let by the Los Angeles Bureau of Power and Light for a second 65,000-kw. steam-turbo-generator to be installed in the Harbor steam plant now under construction. The machine is scheduled for operation in 1943, supplementing the first unit which will begin production before the winter of 1942. The installation has been given an A-2 project priority rating because of its importance in assuring a continued reliable energy supply for defense industries in the Los Angeles area.

Westinghouse Electric & Manufacturing Co. received the contract for the 65,000-kw. unit on a bid of $1,021,682. Riley Stoker Co. will furnish a 570,000-lb. per hr. boiler at a contract figure of $696.906. The boilers will be equipped to burn natural gas, oil or coal. Both Riley and Westinghouse are furnishing the original units in the plant.

Southern Calif. Contractors File Consent Decree

Filing a consent decree rather than fight the case, electrical contractors and associations in Santa Barbara and San Pedro indicted under the anti-trust law in Mar. 1940 were fined a total of $22.000 and given suspended sentences for a year by Judge Leon R. Yankwich in United States Court, Los Angeles, Aug. 5. Specific fines levied were against Harbor District Chapter NECA, $5,000; Santa Barbara County Chapter, NECA, $5,000; Hemphreus-Smith Electric Co., $1,000; McWhinney Electric Corp., $1,000; San Pedro Local B-83, IBEW, $5,000; Local 413 IBEW, $5,000, and 36 individuals were placed on one year probation.

Although indicted earlier, the San Francisco and Oakland contractors have stoutly maintained their actions within the California state law and are determined to fight the case. Judge Roche has set the date of trial for Nov. 18 after several postponements requested by the counsel for the government.

● INCLUDED in the $52,000,000 of aluminum plants to be built by the defense finance corporation and leased by the Aluminum Co. of America will be one 90,000,000-lb.-per-year establishment in the Bonneville area. Exact location had not been settled when Federal Loan Administrator Jesse Jones negotiated a contract with Alcoa.

DEFENSE INDUSTRIES DEMAND—

CONTINUOUS *Energy*

with KEARNEY

TRIPOMATICS

Long known for their practical efficiency in protecting equipment from damaging short circuit and overload currents, Kearney Tripomatic Cutouts, fused with Kearney Fuse Links, are now protecting lines serving Defense Industries.

TODAY, the skill and field training of America's line crews has been enlisted to keep current flowing into electrified equipment, turning the wheels of Defense Industries.

This is no small assignment for these men of the Electrical Industry. Night and day, rain or shine, they must respond, even more readily than ever before, to maintain service.

From now on, it's "eyes-up" to detect first signals of trouble that power line protective equipment might indicate.

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Canadian Plant • Toronto, Canada

KEEP THEM WORKING *with*

KEARNEY PRODUCTS

CONTRACTS LET FOR THREE MORE GRAND COULEE UNITS

Contracts for three additional 108,000-kw. generators and 150,000-hp. turbines for the Grand Coulee Dam power house have been awarded by the U. S. Bureau of Reclamation. The units, designated as L-4, L-5 and L-6, will bring the installed capacity of the station to 648,000 kw. when they are ready for operation in the fall of 1943.

In the meantime Bonneville Power Administrator Paul J. Raver has recommended to a Congressional Committee that appropriations be made to permit the installation of 15 units in the Grand Coulee plant by 1945. He also requested advances of $30,000,000 on a proposed 1943 transmission program estimated to cost $66,000,000.

Awards of the three generators went to Westinghouse Electric & Manufacturing Co. at a figure of $2,697,785 f.o.b. East Pittsburgh. The turbine contract was awarded to Newport News Shipbuilding & Drydock Co. on a bid price of $1,880,000. Woodward Governor Co. received a contract for three governors with pumping equipment on a bid of $82,992.

Acceptance of the first unit installed in the plant has been delayed by the scoring of the main thrust bearing supporting the 802-ton rotor due to operating difficulties with the lubricating system. One previous bearing burned out during the initial tests late in July.

Federal Reserve Bank Sets New Financing Terms

Terms must be shortened to 18 months maximum and down payments on appliances must not be less than 20%. This was the order handed down by the Federal Reserve Board to all lending agencies, banks, dealers and even to banking organizations who may make personal loans to be used in the purchase of appliances. The order became effective Sept. 1; was announced publicly Aug. 23.

Included on the long list of electrical appliances and devices to which these regulations apply are: mechanical refrigerators of less than 12 cu. ft. capacity, washing machines, ironers, ranges, vacuum cleaners, space heaters, dishwashers, air conditioning units, sewing machines, radio and radio-phonograph combinations, furnaces, water heaters, attic ventilators and electric organs. Automobile down payments must be a third of the price, appliances 20%, housing 15% and furniture and pianos 10%.

This move on the part of the President by executive order directing the Federal Reserve Board to restrict installment financing beat the National Assn. of Credit Men to the draw. The latter had made plans to discuss and accept a voluntary curtailment to 24 months and 10 to 20% down payment at its meeting Sept. 4.

Ten Washington Counties Sue Puget Sound Power

Puget Sound Power & Light Co. is now facing condemnation proceedings in ten Washington counties where PUDs have been authorized. Counties are: Kitsap, Jefferson, Clallam, Lewis, Thurston, Cowlitz, Chelan, Douglas, Whatcom and Snohomish.

A resolution authorizing $2,000,000 revenue bonds for purchase of PSP & L's Kitsap county plant, transmission lines and business, was passed by the district PUD commissioners, following the condemnation resolution. The bond issue was based on preliminary estimates made by PUD engineer, W. S. McCrea, Jr. While no statement has come from PSP & L, it is expected the company will oppose the condemnation proceedings. The city of Bremerton, Wash., is also involved in the Kitsap county deal, as it seeks to acquire the Bremerton holdings of PSP & L and thereby divorce itself from the utility district.

Other bond issues voted are $350,000 for Clallam county PSP & L properties; $450,000 for Jefferson county properties. Snohomish county seeks to acquire all PSP & L holdings except certain transmission lines and other facilities expected to be acquired ultimately by Bonneville-Grand Coulee authority. A bond issue of $3.500,000 has been authorized by this district.

Poll Shows Public Opposed to Government Power Plans

People of Salem and Woodburn, Ore., are overwhelmingly against the establishment of a federally-dominated power monopoly in the Pacific Northwest, according to recent polls conducted by the "Front Door Ballot Box" organization of Dan E. Clark, II. This national polling organization, which has surveyed many public questions in Oregon in recent years and reported its findings in the *Portland Oregonian*, has shown a remarkable record of accuracy, hitting within 1.7 per cent of accuracy in the last presidential election in major cities.

The question asked in Salem of a representative cross-section sample, and in Woodburn of every household, was: "There is a bill in Congress which would provide the government with $200,000,000 for buying all power companies in the Northwest. Do you think this bill should be passed?" Woodburn voters answered "yes" 35.3 per cent, "no" 64.7. The Salem result was "yes" 22.5 per cent, "no" 77.5 per cent.

Another question asked in Woodburn at the same time had reference to the proposed bonding to the extent of $65,000 or more to buy or build an electric system for a municipal power enterprise. The poll showed 32.4 per cent in favor of the power bonds to 67.6 per cent against.

A series of questions asked in Salem attempted to get the peoples' viewpoint on the question of whether a small cooperative operating in West Salem should be permitted to come into the downtown section of Salem to compete with the existing Portland General Electric Co. system there, with the cooperative purchasing all its power requirements from Bonneville. This idea, originating with the Bonneville administration, was seen as an entering wedge for the establishment of a municipal enterprise in Salem. Questions asked on this point were: "Does Salem need two separate electrical systems in the business district?" "no" by over 4 to 1; "Is the establishment of a second utility system downtown advisable?" "no" by over 3 to 1; "Do you feel that Portland General Electric's present rate (equal to Bonneville's objective rate plus a 5 per cent surcharge) is a fair price for electric service?" "Yes" by over 6 to 1; and finally, "Do you think Portland General Electric should continue to operate as an individual, free enterprise, or should it be purchased by Bonneville?" For PGE, 69.7 and for Bonneville, 30.3 per cent.

Significance of these polls is that Salem and Woodburn have been focal points of attack in the Ickes' campaign for public power in Oregon.

● A NON-PROFIT ORGANIZATION whose declared objective is to foster public ownership of power, light and gas utilities in all parts of Colorado, has filed incorporation papers with the secretary of state. Incorporators are George E. Saunders, Colorado's secretary of state from 1938-1940; Thomas Gray, former Public Service Co. of Colorado local manager at Fort Collins; Oliver T. McIntosh and C. E. Bloedorn, officials of the Colorado Annuity League. Taxpayers Gas and Electric Users, Inc. is understood to be a service organization equipped to promote and provide engineering and other talent for any community desiring to own and operate a publicly-financed utility plant.

UTAH COPPER TO BUILD 75,000 KW. STEAM PLANT

Utah Copper Co., Garfield, Utah, will begin construction of a $5,000,000 steam electric power plant with an installed capacity of 75,000 kw. early this fall. Operation is expected in the spring of 1943. The copper company's present contract with Utah Power & Light Co. expires June, 1943. The new plant will be located adjacent to the company's concentrating mills at Magna and Arthur.

When the steam plant is completed energy which has been furnished by the utility will be released to apply the sizable amount of power now going to the copper firm toward meeting the rapidly increasing requirements in the Salt Lake area. Defense requirements now in sight and the increase in general requirements during the next two years indicate that the loss of the copper company power load will be entirely absorbed. At present, copper company operations require about 40 per cent of the utility's production, but contribute less than 20 per cent of the power company's revenue because of the low rate contract on the large volume.

Operations of the Utah Copper company have been geared to capacity rate for the past eight months. At the open-pit mine at Brigham, largest on the continent, 80,000 tons of low grade ore are being scooped up every 24 hours by electric power shovels and hauled to the concentrating mills to produce concentrates containing approximately 800 tons of copper. This is the highest rate of operation in the history of the company.

Hearing Set for Arizona Colorado River Power Plan

A public hearing on the application of the State of Arizona for a preliminary permit for development of the Bridge Canyon hydroelectric site on the Colorado River has been set by the Federal Power Commission for Sept. 22 in Washington, D. C. Purpose of the hearing is to ascertain whether under the law the FPC can grant such a permit, and if so, whether Arizona is ready to make examinations and surveys and complete financial plans for such a project.

Application for the development has been before the commission since 1938, but has been periodically postponed. Now Secretary Ickes has objected to issuance of a preliminary permit to Arizona and has "raised a question as to the authority of the commission to issue a license for a power development within the proposed project covered by the license."

● CLINTON E. MILLER was elected president of the Los Angeles Board of Water and Power Commissioners August 21, when the annual election of officers was held. He succeeds James B. Agnew. Elected to the vice-presidency, which had been vacant since the resignation of William B. Himrod was submitted several weeks ago, was C. Clarke Keely. Edward A. Dickson is the fourth member of the water and power commission. One appointment remains to be made by Mayor Bowron.

Municipality Ordered to Furnish Neighbor Power

The Colorado Public Utilities Commission has ordered the Colorado Springs municipally-owned electric plant to furnish service to the town of Fountain, 15 miles north, with "reasonable dispatch," either by purchasing present distribution facilities from Fountain or constructing a new line.

Taxpayers of Fountain, who purchased power bought from Colorado Springs and distributed locally, petitioned the commission for lower rates. Commissioners found Fountain customers were paying much more than those in Colorado Springs and, accordingly, entered the order for relief from this burden, instructing Colorado Springs municipal authorities to furnish current at the same rates prevailing in other urban areas it serves. Present distribution facilities at Fountain cover about six miles and are valued at $6,150.

● W. L. TRUDGEON, who formerly was with the Westinghouse Elec. & Mfg Co. agency and specialties division at San Francisco, has replaced Ralph H. Colborn who was recently transferred to the Seattle office as supervisor of the agency and specialties division. Stanley Johns, also of the Westinghouse San Francisco office, has been made industrial sales representative, replacing Walter Kloster, now located at the company's Portland office.

● ROBERT A. HUDSON and Robert E. Grady, electrical and mechanical engineers, have separated from the firm of Hunter & Hudson to form a new engineering company known as Hudson & Grady. Office is at 525 Market St., San Francisco. Both have been associated for a number of years and have done the design work for a large number of buildings, schools, colleges, ball parks and other works.

● CLIFTON LUDWIG is a new salesman for Westinghouse Electric Supply Co. in Salt Lake City covering Wyoming and Southern Utah. Some years ago he was lamp representative for Westinghouse in the Salt Lake area.

Contractors' Law Changes Strengthen Enforcement

Changes in California law concerning contractors, made at the last session of legislature recently finished, and signed by the governor, include the following:

AB278—The license board may require a bond ranging from $250 to $1,000 in cases where license has been suspended or revoked. This will be used to keep out "bad actors".

AB1731—Requires all general contractors to list their sub-contractors in bidding on public works and prohibits general contractors from changing any sub-contractor's name without consent of officer or agency accepting the bid. This was the much-sought bill to prevent bid peddling by general contractors.

AB2458—Removes 8-hour limitation on all public works to enable contractors to retain their men in competition with national defense work having no such restriction.

AB2514—State Department of Public Works must accept bid bonds as well as certified checks on public works bids.

FB484—A moratorium on the sales tax on national defense projects, such taxes to become due and payable only in event that a final determination by the Supreme Court requires the tax to be paid to the state.

SB761—Several changes to the contractor's licensing law permits the Board to limit the field and scope of operations of a contractor to that in which he is classified and qualified. Licensees may take more than one classification but must qualify for them. Clarified also are many of the license renewal requirements and those dealing with licensing of minors and of owners doing their own work.

SB877—Passed over the governor's veto is the famous "hot cargo and secondary boycott" bill. Provides injunctive relief for persons threatened with injury because of violation.

SB1433—Exempts from state gasoline tax on government projects.

● CLAUDE HALL, assistant superintendent of utilities for the city of Ellensburg, Wash., has resigned to accept a position as inspector on construction at the Bremerton Naval Yard. Hall has been assistant to his father, Utilities Superintendent Willis Hall, for the past three years.

● THOMAS & BETTS have moved their offices in Los Angeles to 103 North Santa Fe, according to Carl Kempf, district manager.

EUGENE PEOPLE SUGGEST NEW COLUMBIA POWER BILL

A new idea for a Columbia Valley Power Authority designed to eliminate political disputes from this legislation emanated from Eugene, Ore., pioneer stronghold of municipal power enterprise in that state. James A. Rodman and Edward G. Boehnke, calling themselves "layman" as far as power is concerned, sent a draft of their plan early in August to Senator McNary after checking it with J. W. McArthur, manager of Eugene's city light department.

The plan suggested a status quo of operations of present generating and distributing systems of both public and private systems in the Pacific Northwest, and an inter-connection of these systems to attain the maximum potentialities of power output. The authority would operate under the direction of a commission of three, one representing the Federal government, one the publicly-owned utilities, and one the privately-owned utilities.

As to coordinating operations between public and private systems, the plan referred to recent studies by utility engineers in the Northwest indicating that certain inter-connections between the Bonneville-Grand Coulee system and the already inter-connected private systems could add 100,000 kw. to the available firm power in the region, with an expense for inter-connections of less than $1,000,000. The authors of the plan contrasted this with the proposal in the Hill Bill for a C.P.A., calling for the use of government credit to the extent of $200,000,000 to buy out existing private utility systems. The authors pointed out that every known method of raising capital was being employed to carry on the national defense program and that better uses could be found for this $200,000,000 of national credit.

Division and State	Total		Publicly and Privately Owned Electrical Utilities		Industrial and Miscellaneous	
	Number of Plants	Capacity in Horsepower	Number of Plants	Capacity in Horsepower	Number of Plants	Capacity in Horsepower
UNITED STATES	2,801	18,868,027	1,527	16,773,622	1,274	2,094,405
Montana	23	501,857	19	499,647	4	2,210
Idaho	68	393,417	44	385,288	24	8,129
Wyoming	13	69,503	13	69,503	0	0
Colorado	56	110,824	28	99,359	28	11,465
New Mexico	7	35,683	6	35,564	1	119
Arizona	15	427,400	14	427,090	1	310
Utah	61	142,972	56	141,137	5	1,835
Nevada	10	708,830	10	708,830	0	0
Washington	76	1,214,504	51	1,143,624	25	70,880
Oregon	78	587,793	53	525,828	25	61,965
California	139	2,438,261	117	2,418,789	22	19,472

● Grays Harbor PUD, Aberdeen, Wash., has announced that any new line extensions will be held up until next year, due to the fact that the district is loaded with work for the next nine months. Robert W. Beck, manager, estimates the district is now at work on $90,000 worth of construction and repair, including rehabilitation of the entire south beach system, building a new inter-tie with Bonneville, and will start work immediately on improving Aberdeen and Hoquiam feeders. Twenty-eight proposed line extensions are among the work postponed.

● Northwest Public Power Assn. has endorsed a bill introduced in the House of Representatives providing for establishment of a Columbia Power Authority with a three-member board to administer the production and sale of power from the government's hydro-electric developments in Washington and Oregon.

Power Commission Reports On Hydro Power Capacity

An FPC report on installed water power in the U.S. on Jan. 1, 1941 reveals that total capacity of U. S. on that date was 18,868,027 hp., a net increase of 367,773 hp. over Jan. 1, 1940. Total capacity for the eleven Western states was 6,631,044—or roughly one-third of the national total. California, with a total installed capacity of 2,438,261 hp., represented 12.9% of the U. S. total. In state rankings California led off, Washington was third and Nevada seventh.

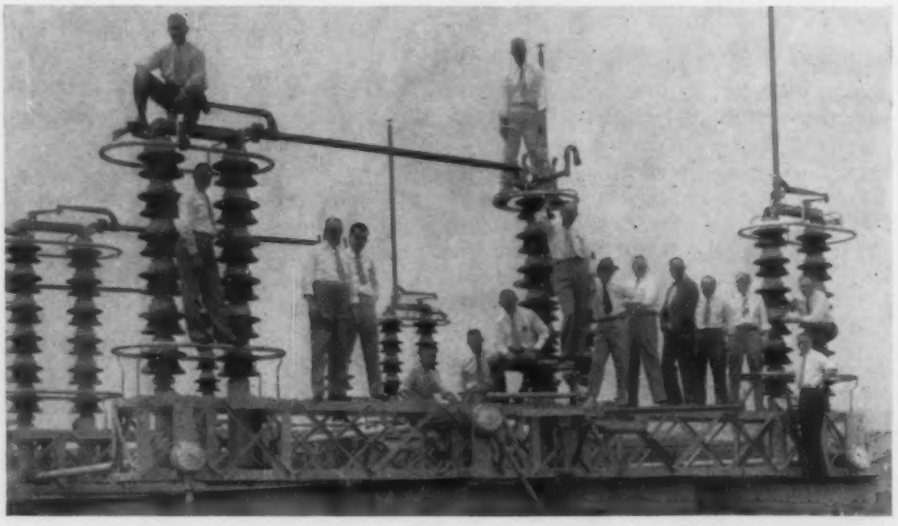
"We Ain't Mad at Nobody"

Neither the folks connected with the Cowlitz County, Wash., PUD nor officials of the Northwestern Electric Co. saw anything incongruous in the PUD picnic at the company's Ariel Dam on the Lewis River on a Sunday early in August. The company has long maintained the property around the dam as a public picnic grounds, offering free electric plate service to those who want a hot dish or coffee with their picnic luncheons, and the PUD folks are just as welcome as anyone.

But for some, the occasion called forth at least a chuckle. One Portland business man, knowing a little about the many bitter political battles between PUD promoters and private utility companies thought indeed that finally the lion had lain down with the lamb, when he went through the grounds observing PUD banners flying, loud speakers blaring, and Dr. Paul J. Raver, Bonneville Administrator, at the microphone.

"We ain't mad at nobody," says the company, when it comes to wanting the people to enjoy the fine bathing, fishing and picnicking facilities of this beautiful spot on the shores of Lake Merwin.

Posing for picture below are Railway and Industrial Engineering Co. engineers and representatives—in the midst of an inspection of a 230-kv. 1,200-amp. tandem disconnecting switch soon to be installed at Grand Coulee.



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HOW TO CUT DOWN

ORDERING TIME • DELIVERY TIME INSTALLATION TIME ON METAL-ENCLOSED SWITCHGEAR

"Unitized" Westinghouse designs now make metal-enclosed switchgear available in cost-saving, standardized sections.

"Unitized" switchgear enables you to get switching and protective equipment which does not require time-consuming special engineering and costly custom-built designs.

Just check the units wanted, for LOW-VOLTAGE METAL-ENCLOSED SWITCHGEAR with Draw-Out Air Circuit Breakers. Thirteen Basic Units meet all main and feeder breaker requirements up to 600 volts; 15 to 6,000 amperes; 15,000 to 100,000-ampere interrupting capacity.

Basic Units 1, 9, 11 and 12 make up this low-voltage metal-enclosed switchgear installation.

Westinghouse

"UNITIZED" SWITCHGEAR

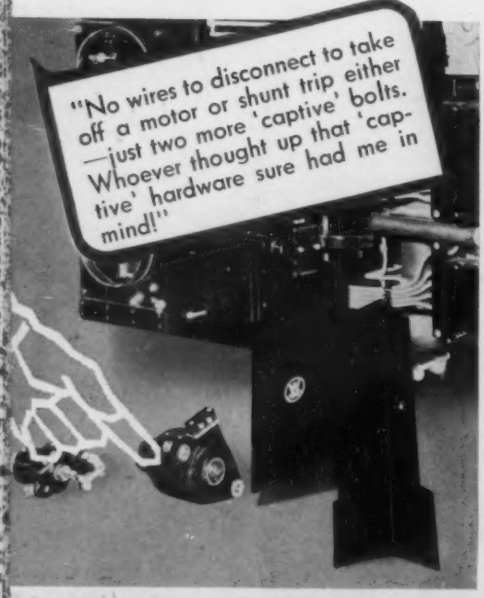
RELATED PROTECTION . . . FROM

"ME?--

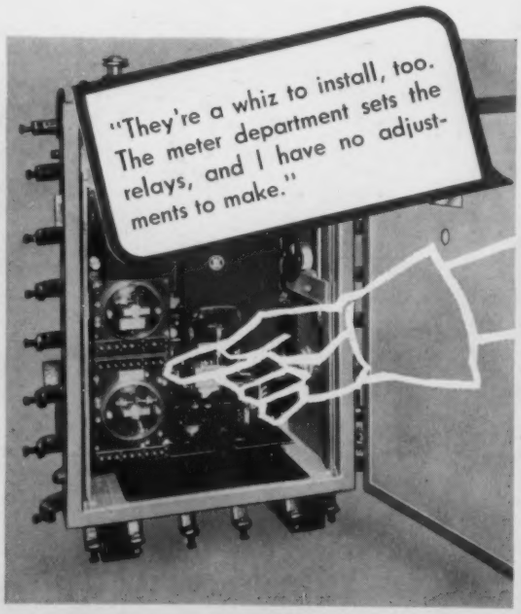
"When you spend a big part of every day in as cramped quarters as most underground vaults, you just naturally go for equipment as compact as that CM-22."

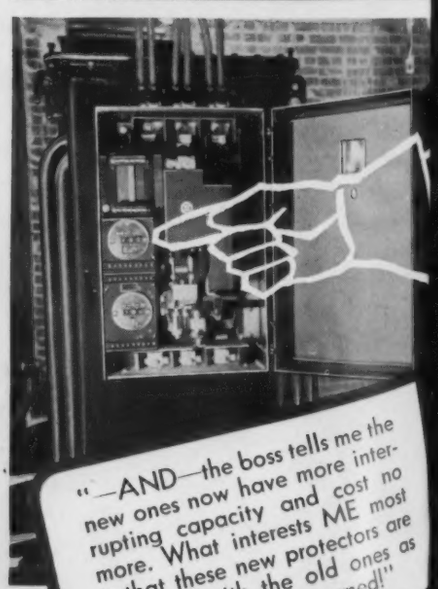
"here's why..."

"No wires to disconnect to take off a motor or shunt trip, either—just two more 'captive' bolts. Whoever thought up that 'captive' hardware sure had me in mind!"



"They're a whiz to install, too. The meter department sets the relays, and I have no adjustments to make."





"—AND—the boss tells me the new ones now have more interrupting capacity and cost no more. What interests ME most is that these new protectors are identical with the old ones as far as my job is concerned!"

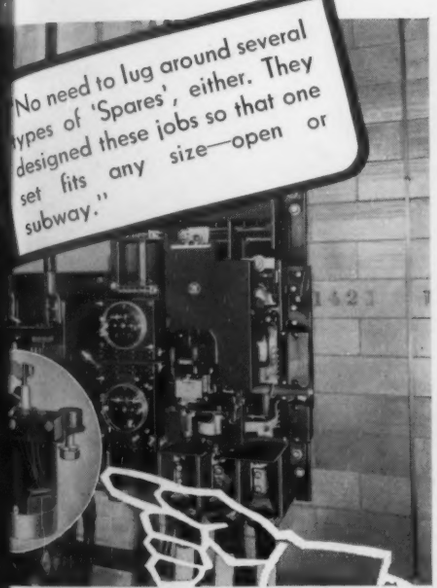
W WESTINGHOUSE ELECTRIC

Westinghouse

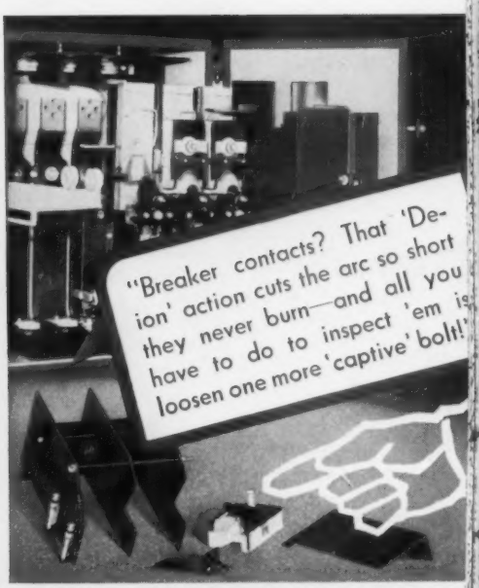
PRINT IN BINDING

GENERATING STATION TO LAMP SOCKET

I'll take Westinghouse Network Protectors!"

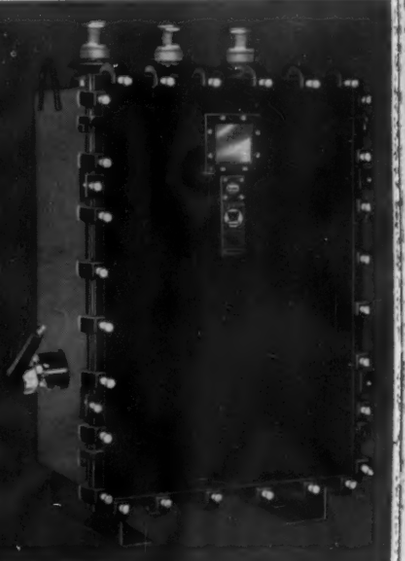


"Best of all, they're built for the man in the manhole to get at 'em! Just loosen two 'captive' bolts—swing the mechanism—and there's the works!"


"Breaker contacts? That 'De-ion' action cuts the arc so short they never burn—and all you have to do to inspect 'em is loosen one more 'captive' bolt!"

The "man in the manhole" and power company engineers alike agree on Westinghouse CM-22 Network Protectors . . . because they were designed to the operating department's ideals.

Addition of 2,500 and 3,000 ampere ratings for open or vault type units, with interrupting capacities up to 40,000 amperes, now makes the compact CM-22 line available in the entire range of ratings from 800 amperes, 250 volts, to 3,000 amperes, 250 volts. Why not get the full story? Ask your Westinghouse representative or write Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa., Dept. 7-N.



J 60420-B

Network Protectors

This new Fuse for Potential Transformers protects in 3 ways:

LIMITS FAULT CURRENT
to 400 amperes maximum, with 20,000-ampere capacity available. At rated capacity (60,000 amp, rms on 15-kv unit), fault current will not exceed 400 amperes maximum by more than a few per cent.

LIMITS SURGE VOLTAGE
to 23,000 volts maximum, with peak system voltage of 19,500. At rated capacity, maximum surge voltage will not exceed 125% of peak system voltage.

CLEARS IN ½ CYCLE
Maximum arcing time is ½ cycle, regardless of whether fuse blows because of direct short, high-resistance short or overload.

Drawn from actual oscillogram of operation of 15-kv BAL fuse—13.2-kv system with 20,000 amperes available short-circuit capacity.

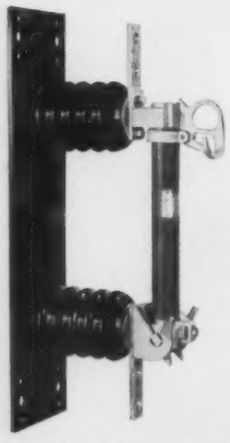
WESTINGHOUSE BAL FUSE ELIMINATES NEED FOR CURRENT-LIMITING RESISTORS; PROVIDES COMPACT LOW-COST PROTECTION FOR POTENTIAL TRANSFORMERS; IDEAL FOR METAL-CLAD SWITCHGEAR.

Current-limiting fuses, which do away with external resistors, have been on the market before. The Westinghouse Boric-acid Limiter, however, is the first that:

(1) protects the system by limiting surge voltage (caused by such a fuse blowing) to well below insulation levels of rotating equipment;

(2) protects the transformer by limiting arcing to ½ cycle under all conditions of fault or overload;

(3) has time-current characteristics such that it will not blow on magnetizing surges.



Disconnecting type mounting includes fittings for top and bottom of fuse. Fuse and fittings can be removed with hook stick, fittings placed on new fuse, and assembly replaced and closed by hook stick.

The BAL fuse consists of three separate elements in a compact unit; a current limiter, a voltage limiter, and a current interrupter. In its smallest rating, it is 4½ inches long, ¾-inch diameter, suitable for mounting on transformer bushings. It is noiseless, smokeless, and flameless in operation.

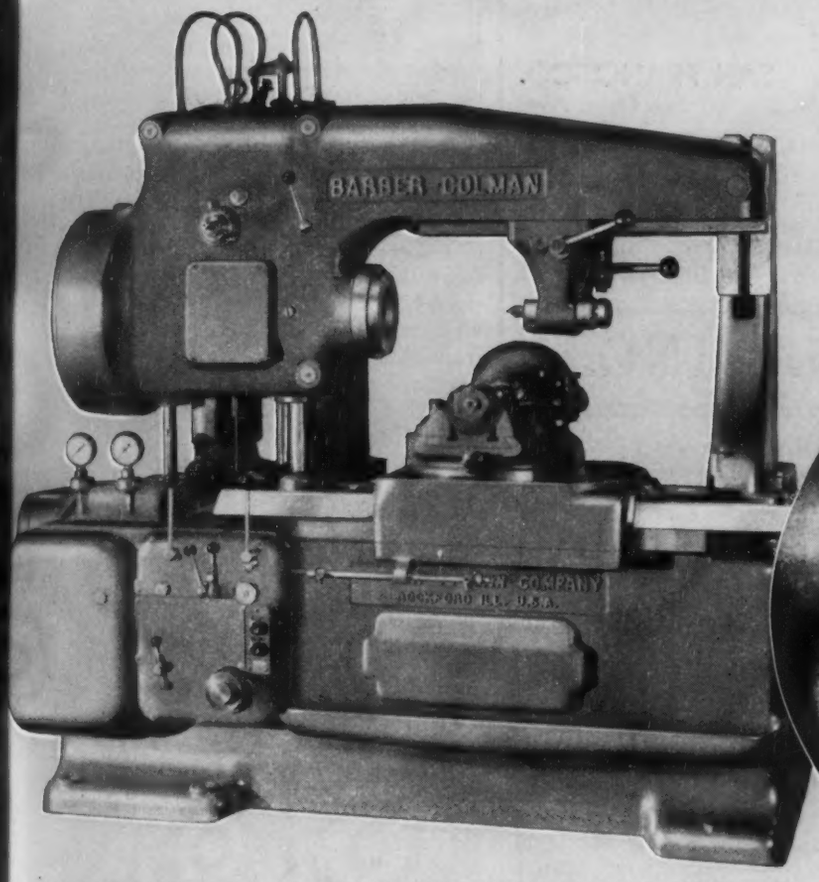
Now available in ½ (N) and 1 (N)-ampere, 2.5 to 23-kv ratings, for indoor service on circuits with short-circuit capacities ranging up to 80,000 amperes, rms. Disconnecting and non-disconnecting mountings can be supplied. Write Dept. 7-N, Westinghouse, East Pittsburgh, Pa., for full catalog information.

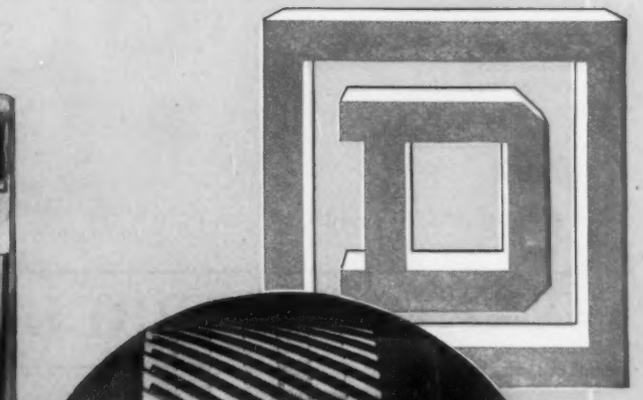
J-60474

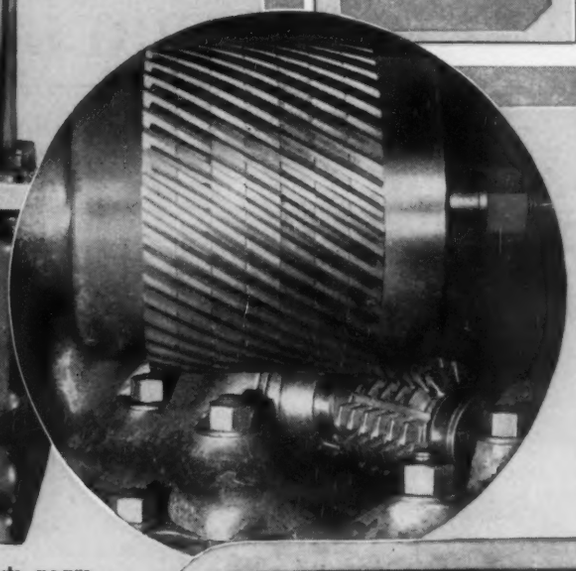
Westinghouse

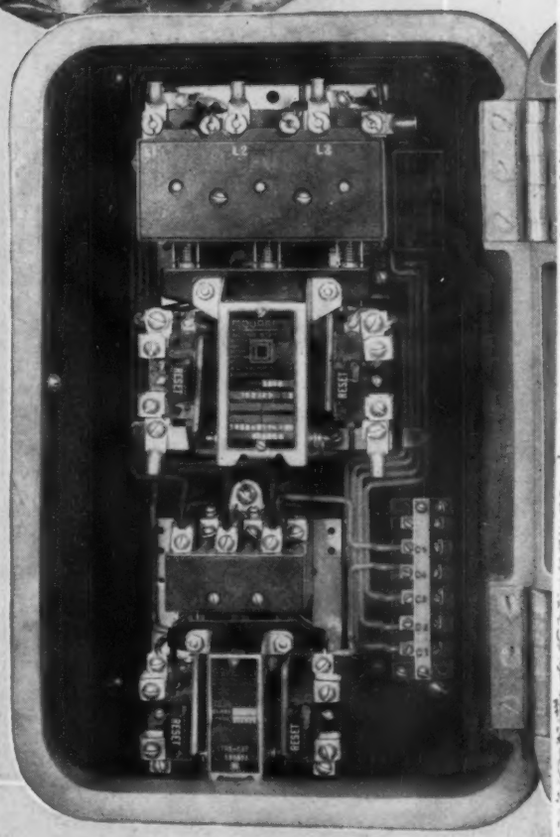
More Machine Tools

with SQUARE D CONTROL









ABOVE • This Barber-Colman Type D hydraulic hobbing machine cuts gears in one operation; eliminates any succeeding operations formerly required.

RIGHT, ABOVE • Hobbing tractor cam shaft gears—seven per load, at rate of approximately 40 minutes per loading. Fine finish and great accuracy are required.

RIGHT, BELOW • Square D motor control—on the job where consistent performance is an essential.

With a new and much larger factory in smooth operation, the Industrial Controller Division of the Square D Company is increasing production as fast as new equipment and materials can be obtained. A major part of its output is going toward national defense—through the machine tool industry and industrial plants.

The Square D line of electrical equipment is complete for all industrial requirements. There are Square D district offices with engineering service in all industrial centers. Competent counsel is available to any design engineer or factory executive faced with problems of motor control or plant equipment. Consult your telephone book and—

CALL IN A SQUARE D MAN

SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

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THE POPULAR TIME SWITCH LINE KNOWN EVERYWHERE

NOW—lower prices and higher capacities

There is a Tork Clock for every regular switching job; 60 minute, 4 hour or daily cycles.

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TILLAMOOK PUD ARRANGES MT. STATES POWER PURCHASE

Preliminary agreement for the purchase of facilities of the Mountain States Power Co. by the Tillamook County (Ore.) PUD in the region served by the latter has been negotiated by Bonneville Power Administrator Paul J. Raver. Purchase price is $675,000, funds to be derived from sales of revenue bonds from a $750,000 issue voted by the district last November.

Properties to be purchased include a 3,500-kw. steam plant and 161.5 miles of lines of various voltages. The PUD will serve 3,100 residential and farm customers and 635 commercial and industrial customers. The district has signed a 20-year contract with Bonneville for 3,000 kw. of power and a transmission into the area is under construction. Plans call for continued operation of the local steam plant.

The Tillamook County PUD will be the first Oregon district to begin utility operations when the final transfer is completed. The preliminary agreement was signed by Z. E. Merrill, president of Mountain States Power, and J. L. Steinbach of Tillamook, secretary of the PUD.

Utah Power & Light Makes Another $100,000 Rate Cut

Approximately 6,000 commercial and municipal street lighting accounts of the Utah Power & Light Co. will save a total of $100,000 a year as a result of new low rate schedules to be put into effect by the utility September 11.

Another schedule now pending before the Utah Public Service Commission, if approved, will result in automatic rate adjustments after January 1, 1942 in the event of increases or decreases in operating costs because of fluctuations in commodity price levels or changes in the amount of taxes paid by the company.

The new schedules, say company officials, are designed to bring about conformity among commercial users, such as already achieved among residential users. An all-service schedule will make it possible for commercial consumers to obtain all types of electric service on one meter at one rate thus simplifying operations of the company by reducing the number of meters and the manpower needed to service them, cutting accounting costs and effecting other savings.

● RATE REDUCTIONS aggregating $11,425 annually have been filed for Bisbee, Ariz., by the Arizona Edison Co.

GREEN BUG LIGHT BECOMES NAVIGATION BEACON

A green fluorescent light, installed to protect his roses from night-working Japanese beetles, has literally placed "on the map" the gardens of W. A. Ramsay, G-E representative in Honolulu, Hawaii.

Navy authorities noticed that the light, at an elevation of 1369 ft. on the side of Mt. Tantalus, just back of Honolulu, was visible for more than 46 mi. at sea and, after ascertaining its purpose, had the U. S. Coast and Geodetic

It Got There

Survey make measurements and list it as an official light, to Ramsay's considerable surprise.

Charts place this "anti-beetle" garden light at latitude 21 deg. 19 min. and 41 sec. north, and longitude 157 deg. 49 min. and 13 sec. west. This precise information prompted a letter by E. A. Crellin, Pacific Gas and Electric Company, to his lightkeeper friend addressed only "Keeper of Navigation Light" at this survey point. Accompanying the story is a reproduction of the envelope which was delivered promptly to the antibeetle lighthouse.

FPC Questions PG and E Pit River Power Rights

Whether or not the $29,000,000 Pit No. 5 power development of the Pacific Gas and Electric Co. must obtain a Federal Power Commission license will depend upon a commission ruling which will follow a report by FPC Examiner E. B. Marsh who conducted hearings in Washington, D. C., August 18-21. Following abandonment of plans for plants at Cresta and Pulga on the Feather River by PG and E and its announcement for a substitute project of equal capacity on the Pit, the FPC stepped in to determine whether or not it had jurisdiction.

The Pit River plant is being built on privately owned property under a certificate of convenience and necessity issued by the California Railroad Commission when the Pit development was started initially. FPC attempted in the hearings to show that it had jurisdiction under the Federal Water Power Act because Pit River affected the navigability of the Sacramento River into which it flowed, and because power developed would affect interstate and foreign commerce. PG and E contended that neither of these conditions held. A point at issue was whether or not the ability of a stream to float logs and its use for that purpose constituted navigability.

In the meantime both the Bechtel Construction Co., powerhouse contractors, and the Thomas Connolly Co., tunnel contractors, were proceeding with work at the site. The plant will house four 36,000 kw. generators. Powerhouse, dam and tunnel will cost $22,000,000, while transmission facilities will add another $7,000,000.

Seattle City Light Sales Zoom to New Heights

In releasing a report for the first six months of 1941, E. R. Hoffman, superintendent of Lighting, declared that City Light receipts are being offset by mounting costs of wages, operation, maintenance and taxes. He declared that the use of electric energy by City Light customers, not including that sold to other electric utilities, has increased 17.75%, while revenues received increased only 5.10%, compared with the first six months of 1940.

High points of the report included: meters reached an all-time high of 104,436, or 2,305 more than at the end of June, 1940. Ranges set a new record of 43,483, an increase of 4,589 over a year ago. Merchandise sales zoomed to $466,911 during the six-month period, a gain of $169,631 over the first six months of 1940. New records were set for kilowatt-hours generated and interchanged, and for those delivered to customers. There were 675,524,000 generated during the past twelve months, 191,754,000 more than during the previous like period, and 563,982,064 were delivered to City Light customers, or 165,047,206 more than during the prior 12 months. Sales of water heaters increased 125%, of refrigerators 33.89%, and of lamps 4.04% it was shown. Total merchandise sales were 57.06%.

● SENATOR BONE of Washington has introduced a new Columbia Power Authority Bill in Congress which provides for a three-man local governing body appointed by the president to administer Bonneville - Grand Coulee power activities. This is the bill's principal difference with a similar measure introduced by Representative Hill, which would have a single administrator appointed by the Secretary of the Interior.

OREGON UTILITY SEEKS POWER FROM BONNEVILLE

Application for 3,500 kw. of Bonneville power has been made by Eastern Oregon Light & Power Co. to the Bonneville Power Administration through LeRoy A. Grettum, vice-president and general manager. This amount of capacity would supply about 50% of the company's peak load for the year.

The application was based upon a recent Bonneville statement that a proposed transmission line, for which funds had been allocated, might be held up pending the ability of the Union County PUD to take power. Stating that "under no circumstance would we wish to apply for this power on behalf of our customers if it interferes in any way with the use of that energy for national defense purposes," Grettum said in his application:

"We deem it fitting and proper to point out that construction of a line between Pendleton and La Grande would close the last gap in a transmission circuit which would extend from Utah to the Pacific Coast. Public and privately-owned power companies in the Pacific Northwest are now engaged in a cooperative program to develop all possible benefits for national defense purposes through interconnection and pooling of resources. From this angle alone, the construction of the line could well be justified, even though the amount of power required in the area we serve is relatively small."

● THROUGH the subscriptions of seven hundred and seventy-five employes of the Central Division of the Puget Sound Power & Light Co., Seattle, a lasting memorial to the memory of Leslie R. Coffin, deceased, has been achieved in the donation of a permanent gift to the Seattle Children's Orthopedic Hospital. A unit that completely shockproofs the early-style mobile X-ray unit such as used for bedside examinations and therapy is now part of the hospital equipment. In addition, the Puget Sound Power & Light Company furnished a new shock-proof X-ray tube and housing complete with all cables and accessories. Coffin was a vice president and manager of the Central District of the company at the time of his death.

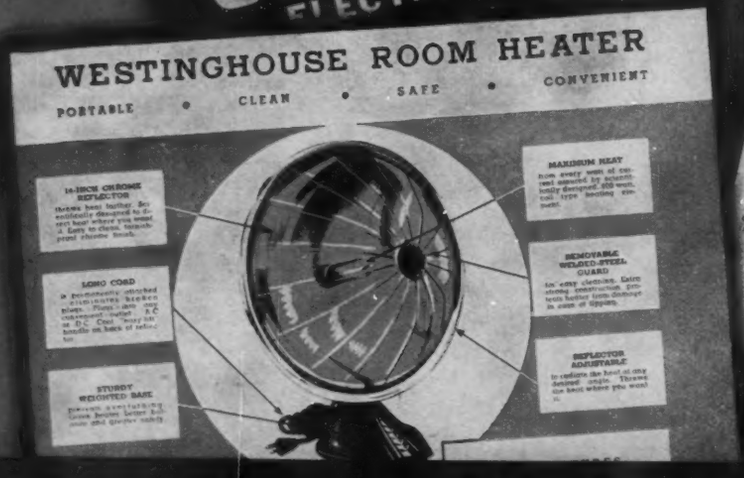
● THEFT of street lights is the latest problem confronting the B. C. Electric Railway Co. at Vancouver, B. C. Over a two day period ten complete suspended type street lamps were stolen in the south Vancouver section. Power company investigators believe the thieves are salvaging the aluminum from the light fixtures.

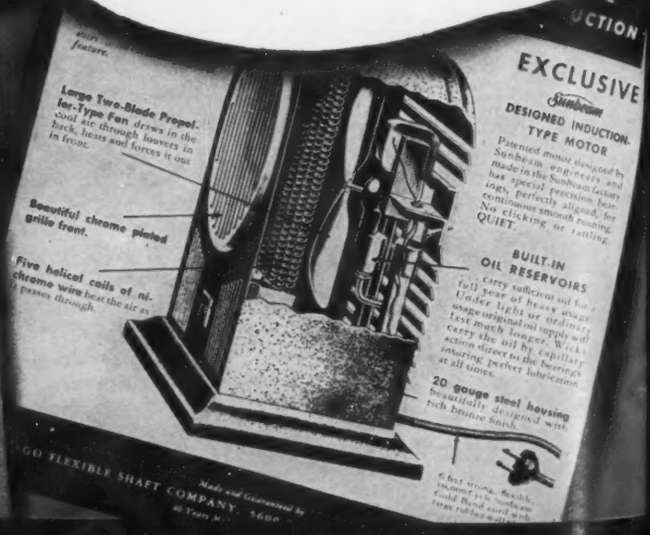
ONLY WATTHOURS *Metered*...

ELECTRIC HEATER LOADS ARE PAYLOADS WHEN METERED WITH . . .

ADEQUATE WIRING SERVES AND SAVES

12,000,000 meters now in service are old and uncompensated, with load characteristics comparable to those indicated by the drooping curve. Considerable revenue losses often result from metering modern appliance loads with these uncompensated meters.

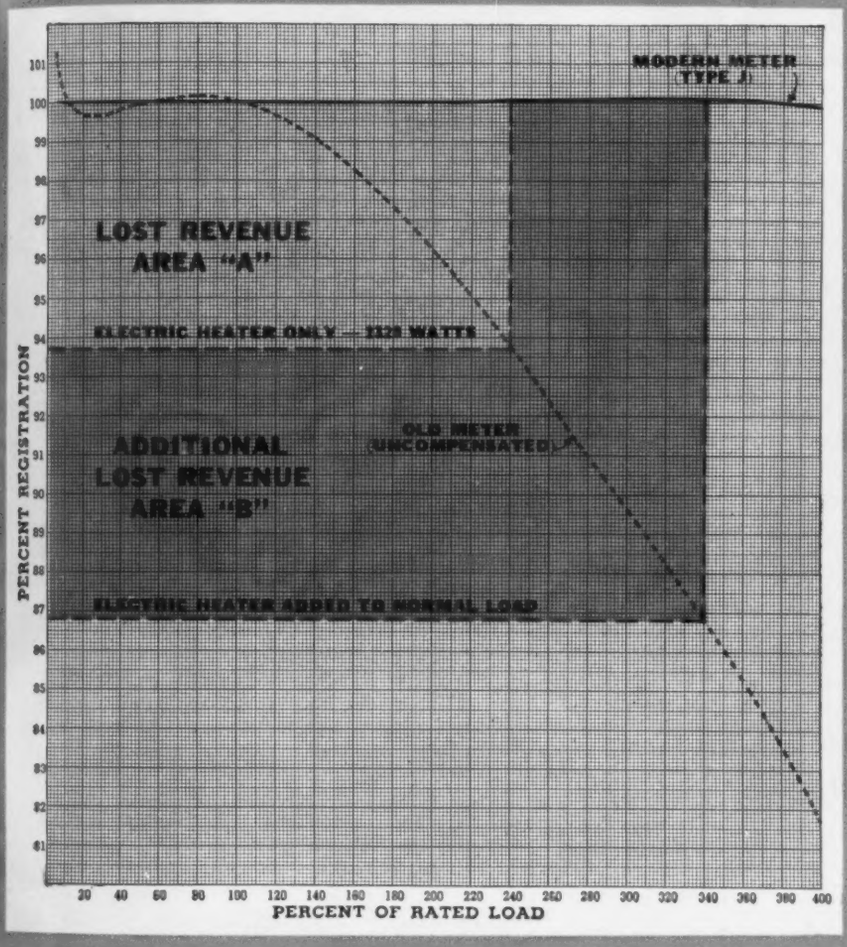


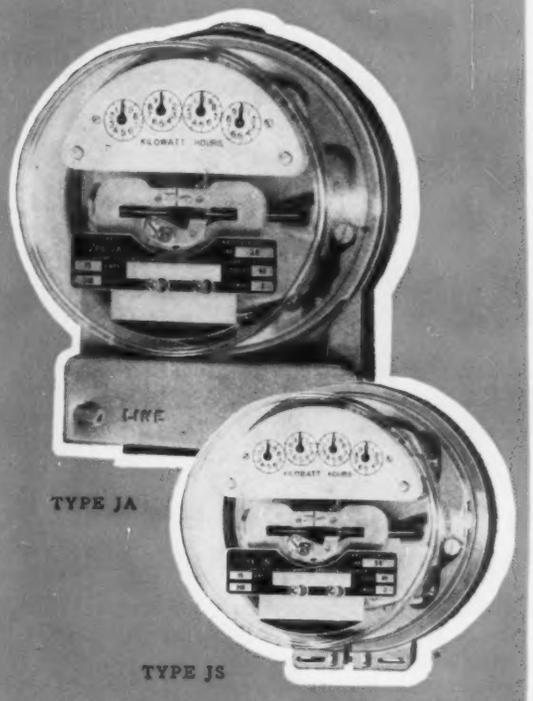


SANGAMO ELECTRIC

...ADD REVENUE *Gains!*

... *Modern Meters*


MODERN METER (TYPE J)
LOST REVENUE AREA "A"
ELECTRIC HEATER ONLY — 2128 WATTS
ADDITIONAL LOST REVENUE AREA "B"
OLD METER (UNCOMPENSATED)
ELECTRIC HEATER ADDED TO NORMAL LOAD
PERCENT REGISTRATION
101 100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81
20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400
PERCENT OF RATED LOAD



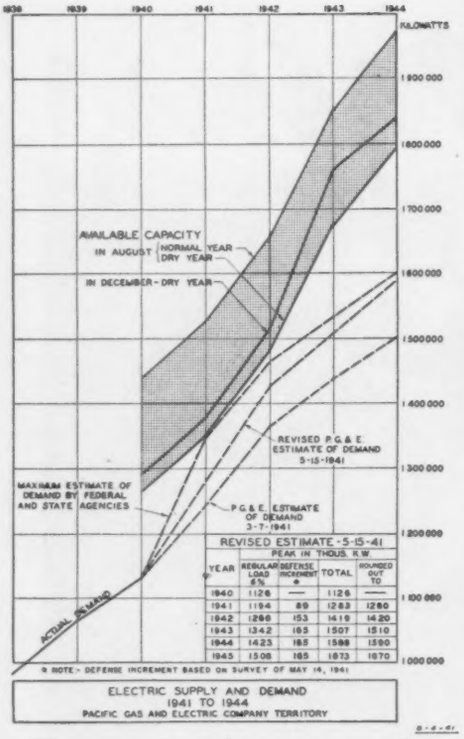
Available in either "A" or "S" mountings, Type J Meters are designed for indoor and outdoor service. Ability to measure accurately loads ranging from a small percentage to 400 percent of the meter's normal full load rating, is an inherent characteristic of the Type J Meter.

THE effectiveness of any merchandising effort is gauged only by the resulting sales. The sale of one-half million electric heaters yearly is excellent proof of the successful promotion of these load builders.

The use of modern watthour meters assures accurate measurement of these added loads . . . . and accurate measurement means full revenue. But with an old, uncompensated meter, the load from one electric heater alone can cause a registration loss of 6 percent, (see "Lost Revenue Area A"). This loss may be as great as 13 percent, (see "Additional Lost Revenue Area B"), when this load is added to other normal loads.

An adequate survey of individual operating properties will indicate where a change to modern meters will be a profitable investment through revenue gains.

COMPANY **SPRINGFIELD ILLINOIS**



This curve shows how capacity will exceed estimated demands on PG and E system through 1944

Black Says Northern Calif. Power Supply Is Adequate

Power capacity in northern and central California will exceed demand by a wide margin in 1944 on the basis of present construction schedules, J. B. Black, Pacific Gas and Electric Co. president, revealed in the company's current statement to stockholders.

"The company has been, and is, keenly alert to the responsibilities imposed upon it to make adequate provision for meeting all the demands of the defense program in the territory served, as well as to supply the normal needs of its regular customers," Black said. "It is prepared to meet these responsibilities. The company this year will have an available reserve capacity of about 300,000 hp., or almost 20% in excess of the expected system load. It has under way a development program which, in the four years 1941 to 1944, inclusive, will increase system capacity by approximately 700,000 hp., or 37%, to a total of 2,600,000 hp. under normal water conditions."

Contracts for new defense business aggregating 400,000 hp. have either been signed or are in prospect he stated. The largest of these is the 100,000-hp. magnesium plant at Permanente, near San Francisco.

● A Pacific Coast Utility carefully salvaged chromium-resistant wire from unserviceable equipment and endeavored to sell it to contribute to the materials drive for national defense. It found junk dealers in its locality not interested in purchase and applied for suggestions to the OPM. OPM forwarded a copy of the letter to manufacturers of resistance wire, Driver Harris Co., Harrison, N. J., Wilbur B. Driver Co., Newark, N. J., and Eaton Mfg. Co., Detroit. Immediately these firms contacted the utility offering to purchase all salvaged chromium wire available.

Spokane Utility Signs Contract With IBEW Local

Spokane Electrical Workers, local 77, IBEW, recently announced that negotiations with the Washington Water Power Co., Spokane, had been completed and the contract been signed with electricians. The contract covers over 700 employees in the Spokane area.

Included in the body of the contract are the Washington state safety laws, making in effect each union member a safety inspector. Another item grants sick leave to employees. Thirteen weeks at full pay and 39 weeks at one-half pay are allowed to ten-year employees. Employees working from five to ten years are allowed 13 weeks at full pay and 13 weeks at one-half pay; 4 full weeks' pay and 4 weeks one-half pay to two to five-year employees. One to two-year employees are allowed 2 weeks at full pay. Two weeks' vacations are granted employees with two years or more service, and one week for one year men.

Emergency Mobile Power Unit Formed by Guards

Organization of a mobile emergency military power unit, such as was described in the June issue of Electrical West, has been announced by General Joseph O. Donovan, commandant of the California State Guard. The initial unit, to consist of one company, will be set up in the Los Angeles area.

Designed to supply emergency power in case of breakdown of local supplies due to bombing or other disaster, each company consists of fourteen vehicles including two trailers carrying 375-kva gasoline engine driven a-c generators. Other equipment makes the unit self-sustaining and capable of operating for a considerable length of time in the field.

The first company will be under the command of Acting First Lieut. Louis H. Ellerman, one of the originators of the idea. Ellerman is assistant superintendent of the testing laboratories of the Los Angeles Bureau of Power and Light. The unit will be used for testing out the motorized generating plant idea.

New Rates Include Taxes In Percentage Surcharge

New rates for residential and commercial service, put into effect this summer by Mountain States Power Co. in its Willamette Valley District, include a tax surcharge added to the base rate in the form of a percentage representing the ratio of the company's taxes to operating income. These schedules, which have been approved by the Public Utilities Commissioner of Oregon, represent a new rate design in the Pacific Northwest, though a substantially similar method of expressing taxes in rates has been tried in some eastern states.

In both the residential and commercial schedules which start with a top of 3.2c per kw.-hr. and run down in steps to 0.9c in the residential and 0.85c in the commercial, the tax surcharge, established at the time of filing, is 16.75 per cent of the total bill figured on the base rate. This percentage is subject to revision each year on approval by the Public Utilities Commissioner.

Commenting on the rates, Z. E. Merrill, president of the company, states: "We believe that this method of billing will make the public more tax conscious and will make the rate schedules more flexible when endeavoring to reflect changes in taxation."

New Federal Pricing Bill Excludes Utility Rates

Utility rates are specifically exempted from provisions of the price control bill as it is now before Congress. The official explanation of Price Administrator Henderson of this is that "complicated valuation proceedings such as are customarily required in traditional public utility rate controversies obviously have no place in the administration of emergency legislation of this character."

Exemption of utility rates, however, does not permit sellers of ordinary commodities to escape authority of the bill by claiming public utility status, nor does it exempt the sale by any public utility of ordinary commercial products or services.

● Six Tentative Standards covering specifications for wood poles have been formally adopted by the American Standards Association, and were prepared under the sponsorship of the ASA telephone group. They represent a consistent system of standards for six major pole timbers of the U.S.—northern white cedar, western red cedar, chestnut, southern pine, lodgepole pine and Douglas fir. Copies of the new edition of these standards may be ordered from the ASA at 20c a copy.

Answer To "Who Am I?"

See quiz on page 71

A. D. Brown

Electriquiz Answers

1. False. California's "Constitutional Franchise" is the perpetual right, granted by the state constitution, to utility companies to supply lighting within a city by virtue of operation there prior to Oct., 1911. Amendment of the constitution at that time did not affect rights previously vested in utilities.

2. True. It is only through widespread public understanding of private utility operation that attacks upon private ownership may be met successfully.

3. False. All employees should be on the alert for sales prospects among their acquaintances, passing along the suggestions to the company's sales organization.

4. False. Commissioners are appointed by the governor for a six-year term of office, staggered so that his appointees are not a majority of the commission during his term of office.

5. True. If all possibility of political advantage or personal gain were removed from public ownership promotion, the movement soon would die out.

6. False. Rates of municipally-owned utilities are established by local authority. The California Railroad Commission has no jurisdiction over them.

7. True. According to the EEI, in 1919 the average residential rate was 7.7c per kw.-hr. In 1940 the average had decreased about 50% to 3.84c per kw.-hr.

TO KEEP THEM

Rolling Out!

In the present national emergency, we all agree DEFENSE COMES FIRST!

An unending avalanche of planes, ships, guns, ammunition, machinery, equipment, supplies must roll out from the production lines at ever-increasing momentum.

Roebling has geared up its electric wire and cable plant to meet the emergency. Day and night the wheels turn at top speed. Every fraction of capacity has been put to work. Electrical wires and cables in endless variety are streaming from the Roebling plant ready for defense duty.

Roebling appreciates the fine cooperation and understanding of valued customers who have experienced unavoidable shortages and shipping delays, caused by the unprecedented production situation.

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San Francisco • Seattle • Los Angeles • Portland

ROEBLING 1841 1941 100th ANNIVERSARY

ROEBLING

ELECTRICAL

WIRES AND CABLES

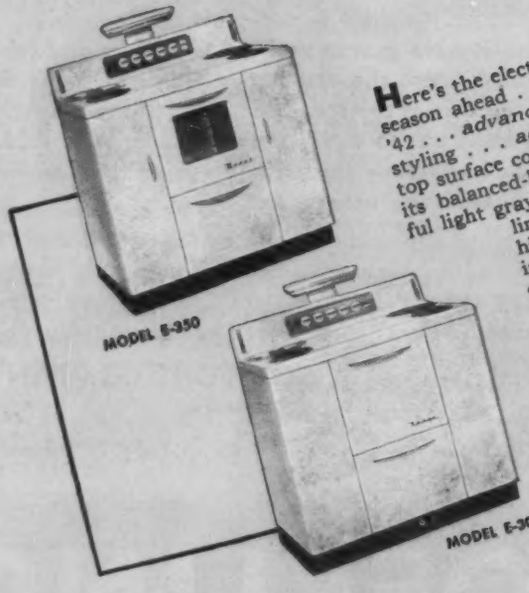
Ready FOR SELLING Now!

7

Sparkling NEW 1942

NORGE ELECTRIC RANGES

MODEL E-450



MODEL E-350

MODEL E-300

Here's the electric range that's a full season ahead . . . the new Norge for '42 . . . *advanced* in its gorgeous new styling . . . *advanced* in its 6-speed top surface cookery . . . *advanced* in its balanced-heat oven, with beautiful light gray speckled porcelain oven liner . . . *advanced* in its high-speed, waist-high broiling . . . *advanced* in all the other features that have made the name Norge one of the best known in the electric appliance field. Seven stunning models, with basic list prices starting at $99.95 . . . each with a profit margin that will make money for you *now*. See your Norge Distributor now or write, wire or 'phone for the complete details.

Sell THE RANGE THAT'S A *Season Ahead* NORGE!

NORGE ELECTRIC RANGES

NORGE DIVISION BORG-WARNER CORPORATION, DETROIT, MICHIGAN

ROLLATOR REFRIGERATION · COMMERCIAL REFRIGERATION · GAS RANGES · WASHERS · HOME HEATERS

A FAMILY OF PRODUCTS—FOR YEAR 'ROUND PROFITS

See NORGE BEFORE YOU BUY!

REA Construction Materials Allotted by OPACS at 50%

Material allotments that will permit REA to continue its construction program on a 50% basis have been made by the Civil Allocation Division of OPACS. REA had reported that civilian and defense demands and defense priorities for strategic materials had made securing of supplies difficult.

REA schedules called for the extension of service to and wiring of 400,000 farms during the next 18 months at an average rate of 22,000 per month. The program is about five months behind schedule and materials have been allocated to permit making up this lag and to then proceed at a rate of 11,000 farms monthly.

Allocations for each six-month period beginning with August, 1941 include: 4,500 short tons of copper; 3,100 short tons of steel; 140 short tons of zinc and 3½ short tons of aluminum. These are to be reduced in any month by the quantities of material allowed REA for construction of defense projects and by the amount of aluminum REA is able to save by arranging to charge for power under flat rates and thus save on the number of meters installed.

● DECLARING that the Grays Harbor PUD, Aberdeen, Wash., can produce power cheaper than it can buy power from Bonneville, City Commissioner O. S. Morris urges the addition of a new turbine to Electric Park system. The proposed unit would have 2,000 kw capacity, boosting the district's production to past the 20,000 kw mark, and give it more surplus power to sell to new industries instead of depending, as it now must, on eventual delivery of more power from Bonneville. Manager Robert W. Beck declares that Electric Park now produces power with hog fuel at a cost of 1.8 mills per kilowatt hour, whereas the minimum cost to the district for Bonneville power is two mills per kilowatt hour.

● DEFENSE POWER DEMANDS in Hawaii are causing work to be rushed on a new 3,500-kw. steam plant of the Hilo Electric Light Co., Ltd., at Hilo on the largest of the Hawaiian Islands. Station equipment will include a 13.8-kv., 3-phase, 60-cycle General Electric turbo-generator operating straight condensing with a Westinghouse condenser and Worthington high pressure and low pressure heaters.

The integral B&W boiler is rated at 56,000 lb. per hour with steam pressure at 450 lb. and temperature of 750 deg. F. The boiler will be under full automatic Bailey control. Oil fuel will be used.

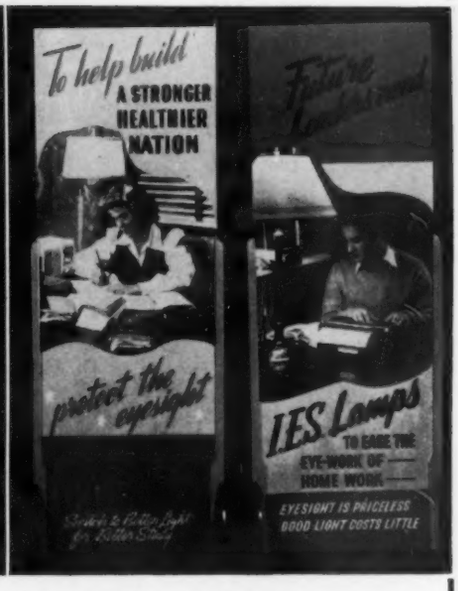
For Your Complete Enjoyment..
Scenes OF PLEASURES AND CONVENIENCES ARE MADE POSSIBLE
WITH LOW COST 24-HOUR
ELECTRIC SERVICE

† W41-10 Electric Whopper Display

←THIS WAS PREPARED ESPECIALLY FOR YOU

.....AND THESE I. E. S. DISPLAYS WERE TOO

† W41-9 Electric Whopper Display (one two-way card, 29½"x42" with stand)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protect the eyesight
Future Leaders of America
I.E.S. Lamps
TO EASE THE EYE-WORK OF HOME WORK
EYESIGHT IS PRICELESS GOOD LIGHT COSTS LITTLE

† E41-9 Electric Panel Displays (two 14¾"x42" two-way cards with stands)

●

The pictures of Stars on "For Your Complete Enjoyment" Display will attract many new listeners to the Radio Programs suggested, including the "Hour of Charm", which will help you with your "Better Lighting" story.

The I. E. S. Lamp Displays are 'just right' for the beginning of your Fall Lighting Activities. They are timely, attractive, economical and easy-to-use. Use the coupon below, or your purchase order, for immediate shipment from Bishop Publishing Company, 155 E. Superior St. Chicago, Ill.

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_____W41-9 Electric Whopper Display.
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_____SW41-910 "We Will Do Our Part." Electric Whopper Display.
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Company.....
Address.....
City and State.....
By..... Title.....

(Note: Please attach separate list for direct shipment to various offices.)

Western Market Indices

News of government orders, construction and expansion—nearly all falling into the general category of national defense—once again provides the principal fare for readers interested in statistical and factual progress of Western electrical industries. Private industrial activity, under pressure of urgent contracts and heavy backlogs, is keeping every wheel turning and snapping up any available material or equipment. Taking these two general pictures in the order of their importance:

Government Orders

A new wave of construction covers $900,000 each at Santa Barbara and Monterey for Coast Guard patrol stations; $1,500,000 in Orange county, Calif., for Naval Reserve aviation base; $1,100,000 for Army air quarters in San Bernardino; $4,419,000 for Army flying school at Lemoore, Calif., $579,973 for anti-aircraft school in Mojave desert; $3,359,000 for San Diego naval training station. Puget Sound area projects include Bremerton Navy Yard awards of $2,194,950 for storehouse and $1,391,409 for yard and pier facilities; $998,443 for Indian hospital at Tacoma. Alaska construction covers additional appropriations of $3,413,000 for Kodiak submarine base; $4,346,000 for Unalaska naval station; a postoffice and customs building at Wrangell; a $74,000 order covering radio transmission and generator buildings at Cordova, Nome, and Anchorage. A $4,000,000 repair and maintenance station for army mechanized equipment is planned for Stockton, Calif.

Electrical orders for various shipyards cover $19,000 crane and pump motors and 37 capacitor equipments costing $31,000 for Richmond, Calif., and $50,000 transformers for Mare Island, Calif. Recent Hawaiian Island orders include a 400-kw. turbine set value $22,000; 10,000 miscellaneous motors size 5 to 50 hp; $35,000 varied equipment order. A further $3,500,000 expenditure is contemplated for the Army air base at Sacramento, Calif., to make it the main repair and supply center for the entire Pacific Coast. $6,154,000 was low bid for the 40,480 ft. wind tunnel at Moffatt Field, Calif. Three of the Army's new $22,800,000 camps for 30,000 men each will be located in Western states: near Corvallis, Oregon; Marysville, Calif. and Great Falls, Mont. New housing includes awards totaling $2,791,800 covering 1,000 dwelling units near San Diego naval base; 300 homes costing $1,929,400 at Long Beach; $3,259,852 for 700 dwellings in Los Angeles; $1,076,313 for 1,692 dwelling units near Mare Island navy yard; $754,000 for 231 homes in San Francisco. Incidentally, all this business produces much inside electrical construction material, but the scale is low as evidenced by a low electrical bid of $49,349 on a basic bid of $1,259,852 for a 400 unit Los Angeles project.

Civil Aeronautic Authority has made 19 allotments averaging $300,000 for Calif. flying fields, the electrical installations of which will average $25,000 each. Work will shortly begin on a $22,800,000 Army cantonment for 30,000 troops near Santa Maria on the central California coast.

Industrial Review

Outstanding industrial business includes a $300,000 electrical machinery equipment for a magnesium plant (Permanente); a $55,000 electrical furnace for same; $10,000 of 150-kw. transformers for a cement mill; $15,000 for fractional hp. motors for calculating machines. Pacific Gas and Electric Co. has ordered $20,000 switch gear, a 1,750-hp. motor costing $25,000, and a group of 500-kw. subway transformers at $30,000, and is extending its Trinity county lines in northwestern California at a cost of $75,000.

Other orders include $61,000 for insulators and $25,000 for cable for Parker Dam; 3,030 fir crossarms for the 115-kv. Coulee-Spokane, Wash. line; $40,503 to Bethlehem for a Bonneville steel substation; and a $199,200 award for central steam plant at Ogden, Utah Army air base.

Industrial developments feature a new cement plant at Goldfield, Nev.; an electric steel rolling mill at Portland, Ore.; the $350,000 National Automotive Fibre factory in San Leandro, Calif. and a Bendix $500,000 addition at Hollywood. Pacific Tel & Tel is replacing its exchange buildings in Richmond and Los Angeles, Calif.

Recent orders and awards cover a $425,390 G-E steam turbo-electric generator for the city of Glendale's second unit; $919,450 for G-E 25,000-kva. condensers and $16,060 for Royal disconnect switches for the Bonneville system; $351,941 copper wire for the two lines from Parker plant in Arizona and southeastern California. Also, an aggregate of 300 miles of telephone wire for Forest Service stock and one carload of copper wire for Astoria sector of Bonneville system; equipment for a 42-mile, 33,000-volt wood pole line to Eugene, Ore.; welding equipment outfits and accessories, $35,000.

Prospective business includes a $1,500,000 shipyard at Olympia, Wash., a $350,000 expansion of a Sacramento flour mill; a $500,000 appropriation for air-conditioning equipment for camps and fields in the extreme Southwest; a $5,355,000 award for woodwork in 55 cargo carriers now building near Los Angeles. $2,736,628 was low bid for Keswick Dam near Redding, Calif.

REA systems are again a business factor, with a $156,344 award for 252 miles of line in Whitman and Garfield counties and $450,000 allotted for 404 miles serving 634 members in Klickitat and Yakima counties, all in Washington; and $200,000 for the Priest River plant in northern Idaho.

Getting back to the industrial picture again, reports show plans for a Goodyear plane parts factory at Litchfield Park, Ariz.; a $4,983,000 ordnance material order to Rheem Mfg. Co. of Richmond, Calif.; and an award aggregating 16 coastal tankers at $950,000 each among several Coast yards. Parker Dam orders include 38,000 insulators costing $60,800 to Corning Glass Co. and $66,454 for 1960 poles; $400,000 for a generating station for San Diego Gas & Elec. Co.; eight 12½-ton electric cranes for Ogden, Utah; two 15-ton gantry cranes for Boulder Dam; and a 15-mile Alaskan REA line serving 334 members on Kodiak Island and costing $75,000.

CONTRACTS

To United Electric Supply Co., Salt Lake City, for fluorescent lighting fixtures, $102,000, for U.S. small arms plant.

To Westinghouse Electric and Mfg. Co., transformer equipment, $300,000, small arms plant.

To Graybar Electric Co. for covering poles and pole line supplies, $21,000, small arms plant.

To San Luis Valley Rural Electric Corp., Alturas, Calif., $80,000 for 60 mi. of line serving 167 members. Previous allotment $559,500 to build 473 mi. of line.

To San Luis Valley Rural Electric Corp., Inc., Monte Vista, Colo., $210,000 for 270 mi. of line serving 505 members. Previous allotment $376,000 for 461 mi. of line.

Fall River Rural Electric Coop., Inc., Ashton, Idaho, $119,000 to build and acquire 76 mi. of line to serve 288 members. Previous allotment $221,000 for 213 mi. of line.

To Lost River Electric Coop., Inc., Arco, Idaho, $15,000 to complete system. Borrower previously allotted $79,000 for 86 mi. of line serving 246 members.

To Prairie Power Coop., Inc., Fairfield, Idaho, $6,000 to complete the system. Previously allotment to borrower $87,000 for 119 mi. of line serving 150 members.

To Malheur Coop. Electric Assn., Vale, Ore., $15,000 to complete generation installation. Previous allotment $197,000 for 222.5 mi. of line serving 512 members.

To Coos Electric Coop., Inc., Coquille, Ore., $224,000 to build and acquire 152 mi. of line serving 588 members. Previous allotment $226,500 for 196 mi. of line.

PEOPLE

made this news

Browne of Westinghouse Promoted to CS Dept.

A. A. Browne, steam engineer for Westinghouse for the past two years, has been appointed assistant manager of the company's central station and transportation divisions for the Pacific Coast district. Browne will make his headquarters in San Francisco. In his new post, he will assist W. P. L'Hommedieu in the operation of these two divisions.

A native of Belfast, Ireland, he came to the United States as a boy when his family moved to Seattle, Wash. He attended grade and high schools in Seattle, and in 1930 graduated from the

University of Washington as an electrical engineer. Soon after graduation, Browne joined Westinghouse at East Pittsburgh, Pa. In 1935 he was transferred to San Francisco as a salesman; served from 1937 to 1939 as a sales engineer at Portland, Ore., then came back to San Francisco to become steam engineer for the entire Pacific Coast District.

● CLARENCE H. COOK, chairman of the board of the Bank of Hawaii, has been named president of the Hamilton Electric Co. succeeding his brother, the late Richard A. Cooke. He has been associated with progressive business developments in Honolulu and Hawaii since his graduation from Yale in 1897. One-time secretary and cashier of the Bank of Hawaii, he has been president since 1909. For many years he has been managing director of Charles M. Cooke, Ltd., largest single stockholder in Hawaiian Electric. He is a director and officer of several Hawaiian corporations and is a trustee of the Honolulu Academy of Arts, Punahou School and various other Honolulu organizations.

It Looks Easy—BUT

—The fabrication of even a Low Voltage Distribution Insulator demands the expert technique of one long skilled in porcelain. There are many such craftsmen at Victor, and their workmanship is the kind that obviates complaints and favorably affects relations between public utilities and their customers . . . . If you are extending your facilities look to Victor for insulators of safe, lasting performance.

V *The Mark of a* **GOOD** *Insulator*

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Cleland Raber

Cleland Succeeds Raber As San Diego President

William F. Raber, president of the San Diego Gas and Electric Co., has retired after 50 years of distinguished service as an electric, gas and street railway utility executive. Hance H. Cleland, president of the California-Oregon Power Co. of Medford, has been elected to succeed Raber. For the present Raber will remain with the company in an advisory capacity to the president and board of directors.

Raber came to San Diego in 1924 from Pueblo, Colo., where he had been head of the Southern Colorado Power Co. Previously he had held important positions in five or six utilities, assuming greater responsibilities with each change of position. During his 17 years in San Diego the utility grew from 81,997 gas and electric customers to 190,414. In addition to taking an active interest in gas and electric trade associations he has been president of the San Diego-California Exposition for 13 years.

Cleland has had a diversity of experience in the utility field. A former member of the Public Service Commission of Washington, he practiced law in Olympia from 1916 to 1919. He served many utilities in the Northwest as a valuation and rate expert. He has been president of California-Oregon Power since 1938.

● JULIAN HINDS, for the past eight years assistant chief engineer of the Metropolitan Water District of Southern California, has been appointed general manager and chief engineer to succeed Frank E. Weymouth, who died July 22. Hinds joined the Los Angeles Department of Water and Power as engineer in charge of hydraulic design, entering the service of the Water District in 1930.

● WILLIAM D. SHANNON, former northwest manager of the Stone & Webster Engineering Corporation in Seattle, has been named district manager for the newly opened district priorities division office of the Office of Production Management, with headquarters in Seattle. The district office, one of sixteen established throughout the country in the past two weeks to coordinate priorities work, is in the Stuart Building, and will handle final priorities on all use of raw materials vital to defense in Washington, Oregon, Idaho, Montana and Alaska. Shannon, through his connection with Stone & Webster, was in charge of construction of many of the power plants serving the Puget Sound area, including Rock Island on the Columbia River. He also had charge of construction of the first trunk transmission lines over the Cascades in Washington, and the Sierra Nevadas in California.

● R. C. MCFADDEN, sales manager of the Southern California Edison Co., Los Angeles, has been appointed a regional vice-chairman of the Better Light-Better Sight Bureau of the Edison Electric Institute by C. E. Greenwood, institute commercial director. The appointment is a part of the bureau's expanded promotional program under which the country is divided into 11 regions, with a vice-chairman directing activities in each area. H. P. J. Steinmetz is national chairman of the Better Light-Better Sight Bureau. California and Arizona are included in Region No. 10 which McFadden heads. Under his supervision Better Light-Better Sight activities will be intensified in these states by developing correlation and interchange of ideas and reports among utility companies, securing a place for the movement on programs of organization meetings, and stimulating a more active cooperation between the optical, educational and electrical groups on the common ground of eyesight conservation.

● VERNON M. MURRAY of Portland, Ore., has been appointed manager of the Bonneville Power Administration's district for central Washington and eastern Oregon with headquarters at Yakima.

Prior to his appointment to the Yakima office, Murray served as chief of the system development unit in the Power Administration's system planning and Marketing division. He holds a graduate degree from the University of Wisconsin in electrical engineering, and before coming to the Pacific Northwest, had been employed as chief engineer for the Wisconsin Development Authority, chief engineer for the Wisconsin Rural Electric Cooperative Association, electrical engineer for the Wisconsin state office of Rural Electrification Coordination and as a teacher at the University of Wisconsin's college of engineering.

● R. J. COBBAN, sales engineer for Westinghouse Electric & Manufacturing Co. in San Francisco for the past 11 years, has been transferred to Hawaii to handle industrial and central station activities in the Islands through the Hawaiian Electric Co., Westinghouse distributor. Effective August 15, he will succeed W. L. McCabe, who expects to enter active service with the U. S. Navy at Honolulu on that date. The new Hawaiian representative graduated from the University of Minnesota in

June, 1909, with an electrical engineering degree. In the fall of the same year he joined Westinghouse at East Pittsburgh, Pa., as an apprentice, and has been with the company continuously since that time. In mid-1910 he was assigned to the company's office at Butte, Mont., as a salesman, later becoming manager at Butte. He was transferred to the Portland, Ore., office in 1923, and seven years later came to San Francisco, Pacific Coast District headquarters, as group leader for the company's Central Station Division.

TRADE notes

Display Service Features National Defense

Bishop Publishing Co., Chicago, Ill., has developed a poster display service for utility companies employing the theme that electric appliances can save valuable time for the modern American homemaker—who can turn this free time to national defense, social or organizational work. The posters, as illustrated in the accompanying picture, promote full use of

for GREATER USEFULNESS-
Modern ELECTRICAL APPLIANCES assure home-makers of leisure to do.... NEEDED VOLUNTEER WORK!
TIME most important NOW!
DUTIES FOR MRS. AMERICA
Modern ELECTRICAL APPLIANCES provide extra time to give to OUR NATION'S WELFARE!

appliances and electric service as an opportunity to return the time saved to constructive community endeavors. According to Glenn A. Bishop, president of the company, the display program provides contact with customers, maintains home load revenue and paves the way for future sales drives.

● OF INTEREST to distributors and dealers in northern California and western Nevada is the announcement of the formation of a company to be known as Nickerson and Rudat, which will have its headquarters in San Francisco. Nickerson was formerly with the Burgess Battery Co. as distributor-sales manager. Rudat was formerly district representative for Burgess. Offices of the new agency are at 383 Brannan St., San Francisco, and they will represent Burgess Battery Co. and other associated lines of merchandise.

● WILLIAM WESTON & Co., 550 Page St., San Francisco, has been appointed northern California representative for Reliance Devices Co., Inc.

TELESCOPE BM SYSTEM

MORE PROFIT AND LESS TIME ON EVERY INSTALLATION

B-M CONNECTORS AND COUPLINGS

Save you up to 25% on material and up to 50% on connecting time. POPULAR—because it's the SIMPLE, EASY METHOD of making installations. Permits stronger, neater connections since it eliminates complications and ends fussing with nuts to tighten.

Only One Tool Needed!

Costs you only $1.25 for the patented B-M indenter (½" size handles 80% of all installations). Just two squeezes, and you have a smooth, neat connection. No other tools required. This tool can save you many times its cost on the first job.

APPROVED BY UNDERWRITER'S LABORATORIES

Strong, Neat Connections

You welcome the speed and ease that the B-M system puts in your hands. These fittings give you complete, well finished work in a hurry—(not water-tight).

DISTRIBUTED BY

The M. B. Austin Co. Chicago, Ill.
Clayton Mark & Co. Evanston, Ill.
Clifton Conduit Co. Jersey City, N. J.
General Electric Co. Bridgeport, Conn.
The Steelduct Co. Youngstown, Ohio
Enameled Metals Pittsburgh, Pa.
National Enameling & Mfg. Co. Pittsburgh, Pa.
Triangle Conduit & Cable Co. Elmhurst, New York City

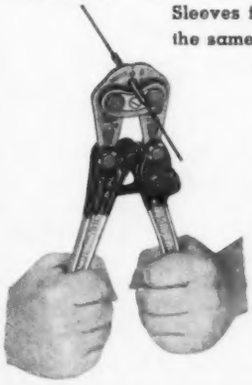
BRIEGEL METHOD TOOL CO., Galva, Ill.

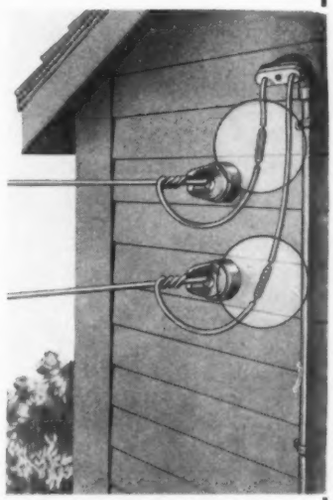
SIMPLIFY House Service Connection Jobs with

Nico press *Nicopress* **SLEEVES**

The easiest, simplest and most economical method of making your House Service Connections is with Nicopress Sleeves and Tools.

With these compression splicing sleeves the joints formed are neat in appearance and may be easily taped—the connections are positive—splices are tight and strong. The Nicopress Sleeves for this type of work are the same as the standard sleeves used for line splicing except that they are shorter. Sleeves can also be supplied in Reducing sizes.





Try "Nicopress" on your next House Service Connection jobs and note what time and trouble savers they are. Order from your jobber today.

THE NATIONAL TELEPHONE SUPPLY CO.

5100 SUPERIOR AVENUE CLEVELAND, OHIO

Canadian Mfr.—N. Slater Co., Ltd., Hamilton, Ont.
Export Distributor—International Standard Electric Corp., New York, N. Y.

Carash Elected Mart Buyers Chairman

Julian Carash, manager of the radio and appliance department of Hink's, Berkeley, was recently elected chairman of the radio and appliance buyers board of the Western Merchandise Mart, San Francisco.

For the coming term Chairman Carash has appointed the following members to the board's executive committee; John Gregory, John Breuner Co., Oakland; G. M. Farwell, Sterling Furniture Co.; W. J. Lee, Sherman Clay & Co.; John Lindenmayer, The Emporium, San Francisco. Other Board members include: Norman Levy and Jack Noodlman, Charles Brown & Sons; C. G. Smith, City of Paris; H. A. Hilmer,

Dohrmann Commercial Co.; Walter J. Epstein, The Emporium; R. O. Hurd, Hale Bros.; B. R. Scott and John A. Williams, Lachman Bros.; W. C. Schetzel, Nathan-Dohrmann Co.; Perry Spencer, Frank Newman Co.; Homer A. Smith, O'Connor, Moffatt & Co.; Charles Redlick, Redlick-Newman Co.; Paul Prudhomme, Schwabacher-Frey Co.; W. Baitinger, Union Furniture Co.; H. Q. Wilson and Harry Zemansky, The White House; and Cass Running, J. H. Wiley; all of San Francisco; A. R. L. Smith, Capwell, Sullivan & Furth; Roy Johnson, Wm. A. Cross, Fred A. Brandis and Arthur L. Deane, Jackson Furniture Co.; Sig. Lion, Kahn's and John Weis and B. Clawson, John Breuner Co., all of Oakland.

● FERRANTI instruments are now represented in southern California by Hockensmith Sales Co., 443 So. San Pedro St., Los Angeles.

● ELECTRIC STEAM RADIATOR CORP., makers of portable steam radiators, have appointed Bailey Dinkelspiel & Associates as factory representatives. Dinkelspiel's offices are at 1348 Francisco St., San Francisco. According to an announcement by the company, plans are being completed to feature their radiator line in national consumer publications, supplementing with folders and store displays, tying in with the advertisements in national media.

● GENERAL ELECTRIC SUPPLY CORP. has taken over the ground floor of a new building in Fresno, Calif., as part of a local business expansion program. In the newly leased premises, Frank M. Koch, Fresno district manager for G-E Supply Corp., said that the company will have about double the space in its former location in Fresno. The branch will have a stock of specialty appliances, construction materials and supplies, industrial equipment, radios, cleaners, fans and table appliances. It will also feature a model electric kitchen.

● ALLIED INDUSTRIES, INC., sales manufacturers representatives, on the Pacific Coast, has been taken over by a new corporation to be known as Allied Industries. According to a company statement, the new corporation will function similarly to the former, there being no changes in sales policies for manufacturers represented. Complete ownership of Allied Industries is held by personnel, which remains the same as in the previous organization. Location of offices and warehouses remain the same and the main office is at Los Angeles, with Will H. Davie as president. Companies represented by Allied Industries are Alphaduct Products Co., Appleton Rubber Co., Collyer Insulated Wire Co., Feedrail Corp., Porcelain Products, Inc., Russel & Stoll Co., Frank D. Saylor & Son and Youngstown Sheet & Tube Co.

Bucks Rishes From Fishes---Going Strong

"Bucks Electric" of Durham, Calif., has been a familiar name to appliance buyers in the northern Sacramento Valley for the past five years. In April of this year fire destroyed a business block in the town and "Bucks Electric," stock and all went up in smoke. Immediately construction was started on a new building to house new present store, opened Aug. 2 by Mr. and Mrs. G. W. "Buck" Sitton. However, "Buck" did not wait for the fire to cool, but opened up business at once in a vacant warehouse until the completion of the new building.

Buck's Electric are General Electric and Wedgewood dealers. Mr. and Mrs. Sitton have been in the electrical appliance business for sixteen years and have been located in Durham for the past five years. During this time they have become firmly established in a prosperous community where diversified farming is the principal industry. "Buck" says, "If you want to sell your prospect you should know his business and talk his language."

The Sittons live on a modern 40-acre farm near Durham, and know the farming as well as appliance business. Incidentally if a prospect prefers to trade a pig or cow on a new electric range or refrigerator "Buck" simply appraises the trade-in and places it on pasture on his own farm until he finds a buyer. He has found this to be a profitable way to close sales.

● HEATING AND AIR CONDITIONING SUPPLY, INC. is the name of the new store started by Clyde Mast and Jack Parsons, 263 Sierra St., Reno, Nev. The new firm has been appointed authorized dealer for General Electric Appliances and opened the new sales room with appropriate promotion last month.

MOVED

Hendee Electric Shop has moved from 1325 S. 4th St. to 3125 Palm Ave., in Fresno, Calif.

With fanfare and spectacular lighting effects more commonly observed in the southern metropolis of Hollywood, the General Appliance Co. moved from 4804 Telegraph Ave. to 2425 Telegraph Ave., Oakland, Calif. Residents of this area are beyond doubt fully cognizant of this new move by this enterprising appliance company.

Lyle Smith, operator of the Truckee Electric Co., has moved from that city to Tahoe City, Calif.

Peerless Electric Construction Co., Ltd., has moved from 8514 South Broadway to 312 West Manchester Ave., Los Angeles.

Urquhart Service Co., Denver manufacturers' representatives, has moved to 16th and Blake Sts. in that city.

Wilbur R. Elliott, Elliott's Electric Service, formerly of Paxton, Calif., has been moved to Quincy, Calif.

Electric Equipment Service Co., formerly of 4487 Beverly Blvd., is now at 625 Parkman St., Los Angeles.

E. Zinzmeyer, agent for Frank Adam Electric Co., has moved from 717 Mateo St., Los Angeles, to 729 Turner St.

Mullenbach Electric Mfg. Co. has moved from 1025 East 16th to 2300 E. 27th St., Los Angeles.

Julius Electric Co. has moved from 1072 Boxton to 10964 Santa Monica Blvd., Los Angeles.

Reliable Electric Co. has moved from 1129 South Columbia St., Portland, to 2005 S.E. 20th Ave.

● LEO J. MEYBERG CO. is expanding its Los Angeles offices and showrooms at 2025 S. Figueroa St. by the addition of a second building as large as the first to double the size of its space. Ground was broken in June for the new building and construction is being rushed in order to take care of increased need for warehousing and display.

● A RECENT Sears Roebuck & Co. advertisement in a Nevada paper for Coldspot refrigerators featured as a headline, "Only Ten at This Low Price." This is probably one of the first advertisements to feature limitations on the number of units available.

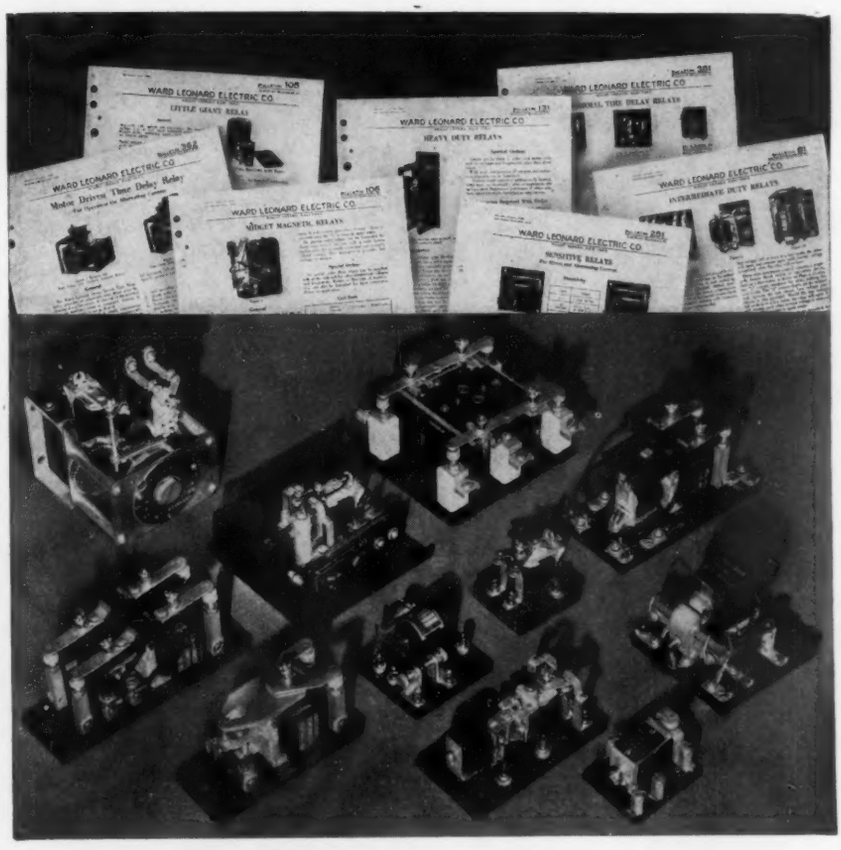
● SILVER STATE APPLIANCE CO. in Reno, Nev., carried large space in a local paper featuring the opening of their new used merchandise mart and service department. It seems very likely with an increasing shortage in new appliances available, that the used merchandise department will do a considerable business. Also, the service department should come in for a fair share of work in view of the fact that many people will have to repair their present equipment rather than replace it with 1942 models.

● BENDIX home laundry dealers in the Inland Empire attended a meeting July 17 in Spokane, Wash., at which A. L. McCarthy, well known figure in the field of home appliances and labor saving devices, spoke. McCarthy told of the exceptional progress made to date in selling the Bendix home laundry. The meeting was sponsored by Harper Meggee, Inc., Spokane, local distributors.

● NEW ELECTRICAL DEALER for Palouse county in Wash. is Earl's Home Furnisher, opened last June in Pullman, Wash. Earl's is owned and operated by Earl Flatt and his wife. Flatt was formerly manager of the home furnishing department of David's Store, Inc., in Moscow, Idaho. The store is to carry the complete General Electric line.

● GOODYEAR TIRE AND RUBBER CO., Inc., with warehouses among others at Denver, Los Angeles, and Portland, has been appointed a distributor for General Electric heating devices and clocks.

● MOTT ELECTRIC LTD., 626 west Pender street, Vancouver, B.C. has been awarded the subcontract for the electrical installation in the new airport development now being undertaken by the department of National Defense at both Aliford Bay and Coal Harbor. Each project involves an expenditure of approximately $80,000.



7 BULLETINS TELL THE WHOLE RELAY STORY

A Relay must not only be well designed and well built, but it must also fit the job as to capacity and assembly details for truly efficient operation. Ward Leonard Relays are known for their crisp action, sturdiness and longevity. The scope of the Ward Leonard line permits selection without compromise.

RELAY BULLETINS

BULLETIN 105
"Little Giant Relay" single pole, single and double throw. Controls ¾ HP on 115-230V.

BULLETIN 106
Midget Relays for light duty available in single and double pole, single and double throw.

BULLETIN 81
Intermediate Duty Relays in single and multi-pole arrangements, single and double throw.

BULLETIN 131 & 132
Heavy Duty Relays single and multi-pole, single and double throw, contacts rated up to 25 amp. on 125-250V.

BULLETIN 251
Sensitive Type Relays for direct and alternating current operating on .014 watts.

BULLETIN 351
Thermal Time Delay Relays with thermostat built into relay assembly.

BULLETIN 362
Motor Driven Time Delay Relays for operation on alternating current.

WARD LEONARD
Electric Control Devices Since 1892

WARD LEONARD ELECTRIC CO., 48 South Street, Mount Vernon, N. Y.
Please send me Bulletin No. .....
.....
Name .....
Firm .....
Address .....
City ..... State .....

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PROFILES *of the month*

Creative minds at work at right are: Jim Grier, display asst.; W. E. "Bill" Parnim, display manager, and Leo May, artist; all of B. C. Electric Co. According to our informant, this star session will produce some of B. C.'s noted display advertising

Left: D. W. 'Doc' Baird, Idaho Power Co. residential sales, has made a hobby of collecting antiquated bulbs; uses them in connection with talks and demonstrations on modern lighting—good idea?

Right: Fred Benz, U. S. Rubber Co. wire department manager, knows that trout grow big and trustful in Montana streams, as witness catch displayed

Scene at S. F. Electrical Contractors Association picnic at San Jose Mission, Aug. 23. Left to right: Mrs. Ed. Dowd, Geo. Abbett, assn. pres., two Dowd tykes, Ed Dowd, picnic chairman, Mrs. Abbett and son

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

and the Electric Appliance Society

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

For the first time!
A retail-wholesale-utility designed

LAMP CAMPAIGN

featuring

"Lamps for every member of the family—
for every purpose."

Last month in this space we alluded to a campaign tentatively scheduled for "two weeks in September." Plans are now complete. The dates are September 15 to 27 inclusive.

During this period, the greatest advertising promotion on floor and table lamps ever attempted in this area will be carried on by the P.G. and E., the Electric Appliance Society and retail stores.

The promotion will include newspaper publicity stories, newspaper advertising, billboards, bill stickers, direct mail and display material.

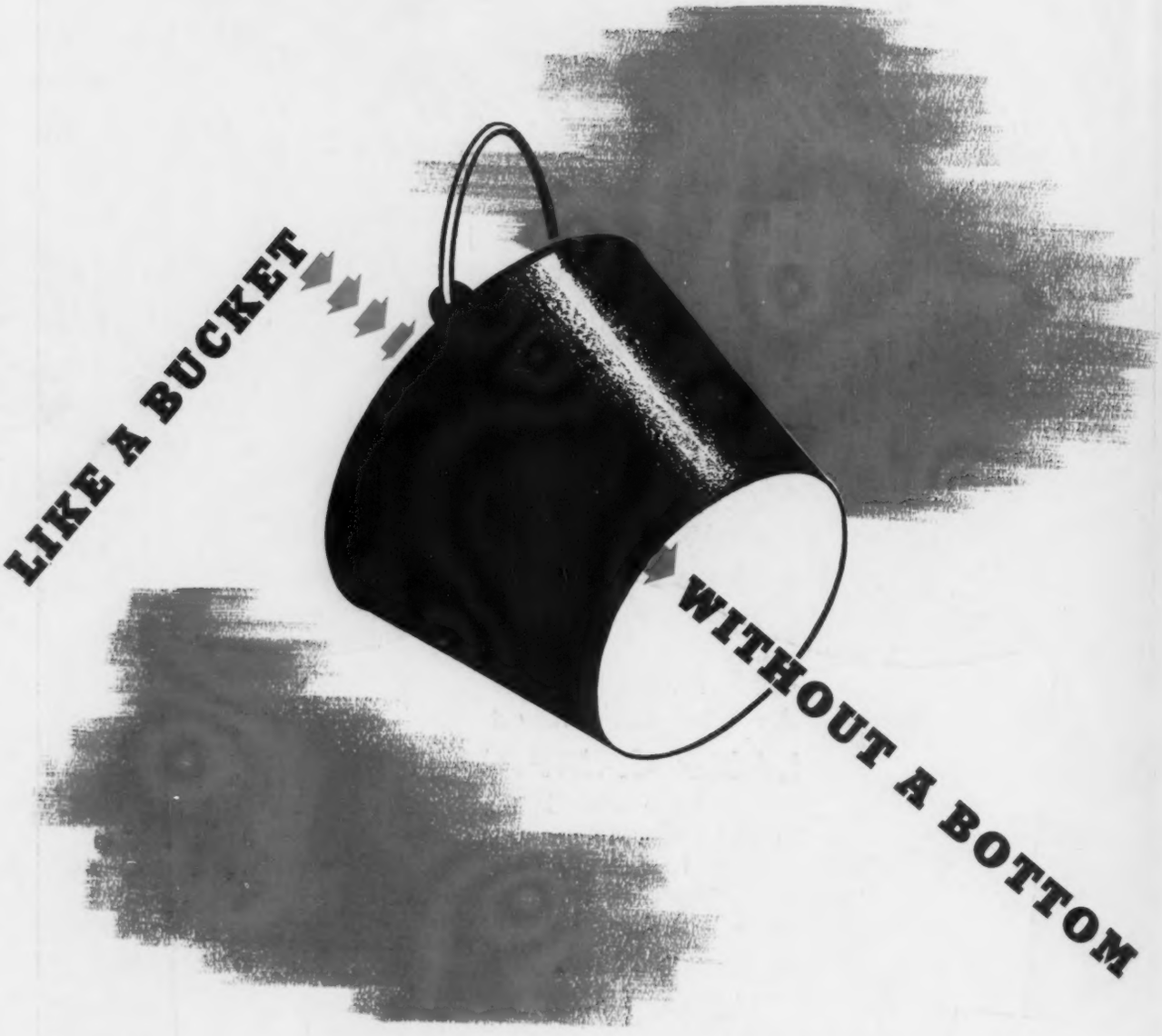
The amount of business to be so stimulated will probably exceed anything ever done in a like period in the history of our business.

We suggest you read the Electric Appliance Society bulletin—carefully!

SEPT. 1941

EW 109-941

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.



There's something essential missing from a home without enough electric outlets—like a bucket without a bottom.

But adequate wiring brings the home up to modern standards—makes it a better prospect for the entire electrical industry.

Adequate wiring makes a bigger profit for the contractor, a bigger sale for the equipment manufacturer, a bigger market for the appliance dealer. And the home-owner profits too—lives a better life with the modern conveniences electricity offers.

The thousands of new homes that are being built now provide thousands of new prospects for electrical merchandise—**only** if these new homes are well wired with plenty of convenience outlets. Let everyone—architect, builder, contractor, home-owner—know the importance of adequate wiring. Write for free promotional material and full information on the subject.

PACIFIC COAST ELECTRICAL BUREAU

601 WEST 5TH STREET LOS ANGELES • 447 SUTTER STREET, SAN FRANCISCO

CERTIFIED ADEQUATE RED SEAL STANDARD WIRING

8-41